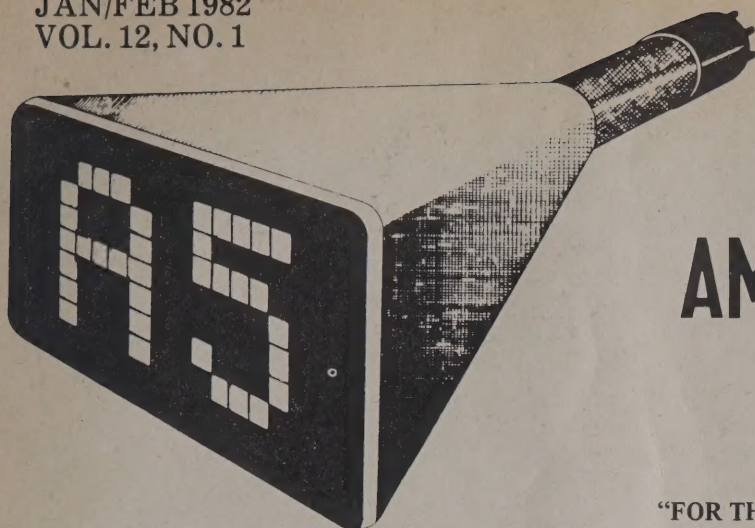


JAN/FEB 1982
VOL. 12, NO. 1

Our 15th Year

\$2.00



AMATEUR TELEVISION MAGAZINE

"FOR THE SPECIALIZED COMMUNICATION RADIO AMATEUR"

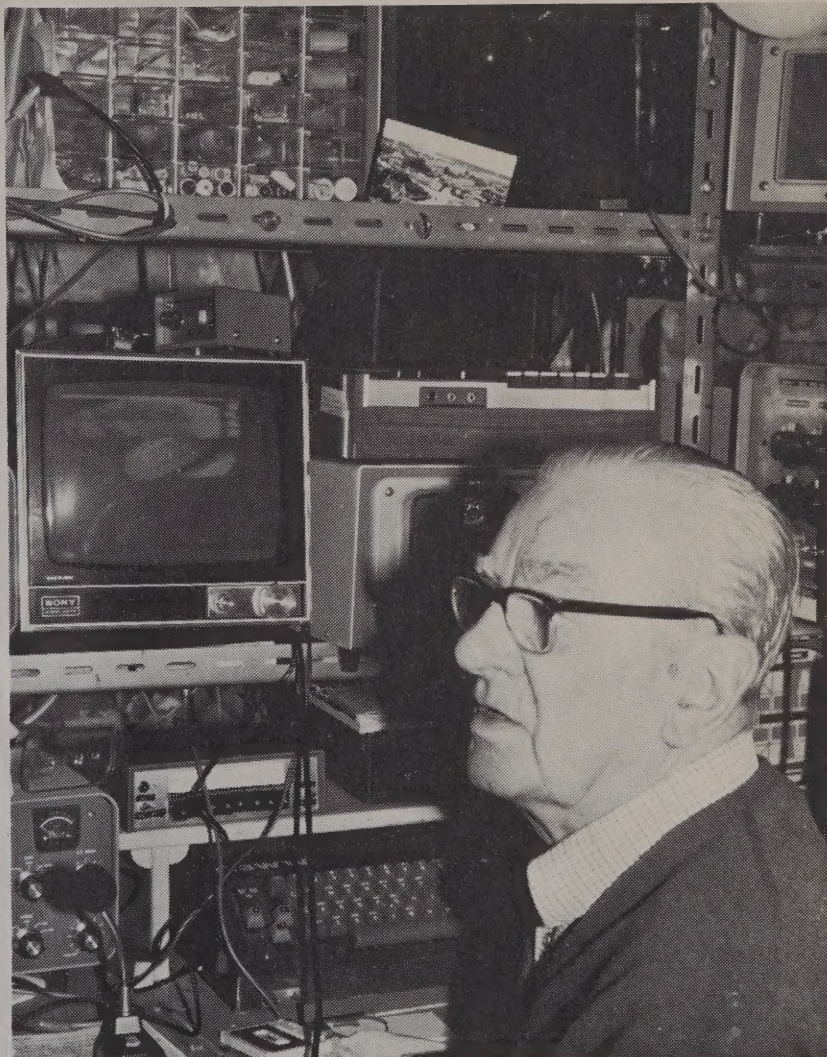
(FCC APPROVES SSTV AND FAX FOR GENERALS ON HF BANDS)

1982 THE TREND CONTINUES TOWARD SPECIALIZED COMMUNICATIONS

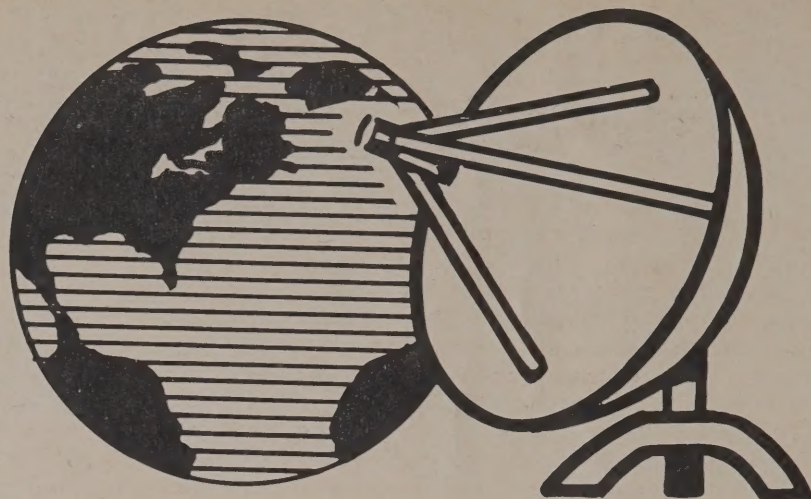


ATV SPECIAL ISSUE!

- HISTORY OF A5 ATV MAGAZINE
- HOW TO GET STARTED ON FSTV
- ATV VIDEO CONSOLE PROJECT!
- BANDPASS FILTER FOR ATV
- AMPLIFIERS FOR FSTV DX'ING!
- ATV FREQUENCY QRM ALERT
- PARABOLIC ANTENNA TEST
- FEBRUARY SSTV-WAS CONTEST!
- COLORSCAN BY VE3EGO
- TRIBUTE TO SSTV'ER G3WW
- TRS-80 COLOR COMPUTER SSTV
- HOW TO GET STARTED IN RTTY!
- AND MUCH MORE!



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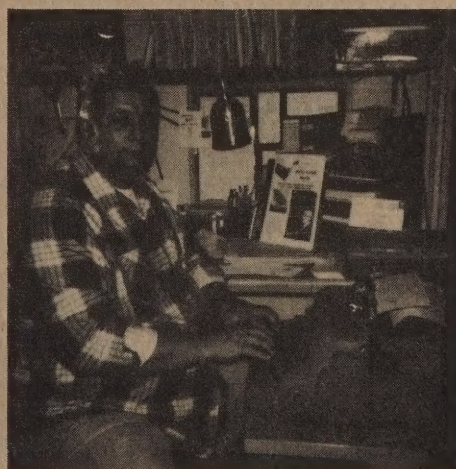
JAN/FEB 1982
VOL. 12 NO. 1

In Review

Publisher:
Amateur Television Magazine
INTERNATIONAL



Happy New Year! 1981 was certainly a frustrating year for all of us. I hope things will turn around and Reganomics proves fruitful for the economy. It is forcing everyone to become very conscious of how their money is spent. Now that I have got a firm grasp on the publishing business, it didn't take long to realize some business problems that have been going on for quite a long time and must be re-considered to insure a successful future for ATV Magazine. I am speaking of past foreign subscription policies; The past couple postage bills incurred have shown that foreign mailings at Air-Mail -- rates cost more (127 subscribers) than over 1500 US subscribers! At the 3-4 oz. weight rate of \$2.08 per issue (Air-Mail other than Canada/Mexico/C. & S. America) equals \$12.48 per year and the old subscription price was only \$10.00. That did not allow for labels, envelopes, bundling, handling and printing costs let alone any profit \$\$\$ for the magazine to grow on. See the problem? The solution seemed best solved by establishing two rates for the foreign subscriber; one for surface rate mailing which takes a long time to arrive, or for Air-Mail mailing at a much higher cost. So, with the 1982 new year comes a hefty hike in overseas rates. For US and other subscribers, the cost was raised slightly higher than previous rates and considering that the magazine endured three postal rates without a consumer price raise, I'd say it is about time for one. I believe that I have established my credentials with the past three issues of what direction ATV Magazine will head for the future. The reader is getting nearly a 45% gain in the number of pages per issue and amount of articles with the new format. We have received only a couple letters against the change of direction versus hundreds of letters and comments in favor of the new look. I think you will agree, that ATV has not suffered at the gain of coverage of other specialized modes. A vast majority of you took full advantage of our Sep/Oct 1981 "fall savings" offer of sign up for three get one free deal! We even took latecomers to the offer and any of those regular subscribers renewals at the old rate until November. When compared to other Amateur Radio Magazines that offer little of the articles you are interested in, our \$10 basic price is certainly a real bargain! I have beat the "bushes" for advertisers that support our mode of communications, not merely sell the gear. Support ATV Magazine advertisers-as they are helping maintain this 15 year old tradition periodical! Maybe you have noticed that I am stating ATV Magazine rather than A5 ATV Magazine? We'll, I am trying to get myself in the habit I guess as the effective date of Docket 80-739 nears which in part calls for the redesignation of Amateur transmitting codes. Under the new plan, ATV (FSTV) will change from A5 to C3F and SSTV (Analog) to J3F emissions. I guess this conforms to international standards a bit better but takes a bit to get use to. My thanks to David Sumner, K1ZZ for bringing it to my attention. 1981 was a "big" year for COLOR SSTV! This issue includes one of the newer modifications by Canadian subscriber VE3EGO. The next issue will carry Volker Wraase's SC-422A 3-memory COLOR unit with a neat little 'animation' feature built-in. Rumors from a reliable source say that it is just a question of time before a single-memory COLOR frame is able to be sent in one 8 second frame! Did you ever think things would go this far, Cop? The March/April issue will give more details of what to look for at Dayton this year and don't miss the big ARRL National Convention at Cedar Rapids, Iowa this year. A5 ATV Magazine will be there! For you subscribers that have sent in money requesting back issues or article copies, be a bit more patient. I have arranged with Ralph Wilson, WBØESF of Cedar Falls, Iowa to make printed copies that you request. The year-end listing of past issues and articles will be published regularly so you newcomers can get a chance to see what you missed out on and can re-obtain from Ralph. Let me further add that these are very good quality copies (some look better than the original!). Welcome Joe Elliot, KØWVN to A5 Magazine! Joe works at Flesher Corp. in Topeka and lends his expertise in RTTY. Last issue's article on Bloomington ATV brought alot of interest on the 13 foot Earth Station dish built by K9KTH and WB9KBJ. A followup article on how to do it is underway! W7AMQ and W7KPW/5 have been sending SSTV thru Oscar 8 successfully for a couple years now (others?) and will be displaying their work in an article with photos in the next issue (March/April). Gerard Wilson, WA6RDA (System Electronics) is getting ready a seven part series on TVRO reception. Stay with him all the way and be seeing CATV pictures by the end of the year! Clay Abrams, K6AEP stood still -- long enough to write a fantastic article on MICROS and AR. Keep those cards and letters coming, folks! 73's WBØQCD



Tell your friends about A5 ATV MAGAZINE!

MIKE STONE WBØQCD

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(Required by 39 U.S.C. 3685)			
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A5 AMATEUR TELEVISION MAGAZINE		9 4 4 9 6 0	
3. FREQUENCY OF ISSUE		2. DATE OF FILING	
BI-MONTHLY		OCT 20, 1981	
4. LOCATION OF KNOWN OFFICE OF PUBLICATION (Street, City, County, State and ZIP Code) (Not printers)		A. NO. OF ISSUES PUBLISHED ANNUALLY	
POST OFFICE BOX "H", LOWDEN, IOWA 52255 0408		SIX	
5. LOCATION OF THE HEADQUARTERS OR GENERAL BUSINESS OFFICES OF THE PUBLISHERS (Not printers)		B. ANNUAL SUBSCRIPTION PRICE	
804 JEFFERSON AVE, LOWDEN, IOWA 52255 0408		\$7.50 (1981)	
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MANAGING EDITOR (Name and Address)			
Same as above			
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In accordance with the provisions of this statute, I hereby request permission to mail the publication named in Item 1 at the phased postage rates presently authorized by 39 U. S. C. 3626.			
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Michael W. Stone Owner/Publisher			

Letters to the Editor

"Someone blew it in the Sep/Oct 1981 issue (page 44)-the company listed does not manufacture the K6AEP boards?" -N1AOC Mass.
Editor: Sorry, there are two companies by the same name in CA. The correct address should be The Microworks, Inc. 1942 El Camino Real, Encinitas, California 92024 phone (714-942-2400) 73

"How about a forty-meter SSTV group on 7171 Mhz? Make the ole winter go faster in the midwest! Am looking forward to seeing all of you SSTV'ers again at Dayton 1982! We are all staying as last year at Days-Inn North (WA7WOD, KD6HF, N8AES) (WB0QCD will be there also!)" Earl, N8AES, Michigan

"I recently received the September/October issue of ATV Magazine. I just wanted to let you know that I am very pleased with your new format and expanded interest in all modes of Amateur Television. I also would like to mention that I support your thoughts of expanding into other areas of specialized communications such as RTTY, MICROWAVE, EME, FAX, SATELLITES, etc. I believe this will increase the interest in the magazine by all Amateurs and provide manufacturers of specialty-mode equipment a single magazine to place their ads and announce their new equipment. I am especially pleased with the section entitled "Members Ads". I think this is a handy service for your subscribers and, in fact, you will find my ad enclosed for your next edition. As far as future issues go, I would like to see more photos of operators and "shacks" and equipment they are using. Enclosed is a photo of my shack for publication in the future. From what I have been able to obtain information-wise, there are only two A5 SSTV'ers in the state of North Dakota. One is in Bismark and I am located in Rugby. Due to our sparse population and distance between cities, FSTV is impractical at the present time. Thanks!" Howard Burns-Rugby, North Dakota

"The magazine looks great! I think your opening commentary said it all very well...philosophy, expansion into other fields but still keeping FSTV primary. This issue is undoubtedly one of the best!" -W6ORG, Tom O'hara, Arcadia, California

"The magazine is very well received here in Canada. I have 37 states confirmed for A5 Magazine WAS SSTV award. I need ARK-COL-DEL-HAWAII-IOWA-MAINE-MD-MONT-NH-SD-WASH-WV and WY to go. I monitor both ten and twenty meters, come-on you guys, give me some help!" -VE6PW Bert-Abta

"More A5, less SSTV!" -Jim Stitt, WA8ONQ, Middletown, Ohio

"I have found A5 Magazine very helpful. Enclosed is a LIFE membership!" -VK5ACE C. Rieger

"Congratulations: As a recently new subscriber, I have not been impressed with the magazine due to the fact that it appeared to be more ATV orientated and as I am in SSTV and RTTY I had decided not to renew my subscription next March. The Sep/Oct issue has changed my mind. This has been the best yet! It sparked my interest enough that I am enclosing my check for 3 years plus one year free (offer). I am impressed and hope you continue on, wishing you much success..." -Bob Vance, N1AOC-Cheshire, MA.

"Glad to take advantage of your September "special offer"! Congratulations on taking over the helm of A5 Magazine. Do you know of any ATV activity in the KC area? Gladstone is a northern bedroom community for Kansas City, Kansas. Am using a "J" beam and the W6ORG TC-1 unit on 439.25 Mhz. Just moved from Grand Island, Nebraska where I was sending TV to WA0JBL." -George Carr, WA5KBM/0

"I like the new format! Here is my \$20 for 4-years." -Albert Kopec, KB2NG, Dundee, New York

"Here is my money for the 4 year special offer. Congratulations on your investment! I am sorry to say that I disagree with your project to cover the whole spectrum of specialized communications. In my opinion, there are other publications for that you will not be able to reach the highest technical point of ATV with other material to cover. There is so much on ATV already, NBTv, MSTV, SSTV, etc." HB9AYX - Bernard Decaunes, Penthalaz, Switzerland CH-1305.

"I was impressed with your first issue of A5 Magazine, and I am glad to see ATV once again being promoted to Hams nationwide. I will be sending you a "series" of articles soon for those who truly interested in building up an inexpensive TVRO system. 73's and continued success!" -G. Wilson, WA6RDA

"I am very happy to receive the midwestern "SYNC BUZZ" ATV newsletter and am glad to see the Iowa group going to horizontal polarization. Instead of 50 miles, 500 miles should be sought after. We have worked Wisconsin, Indiana, Michigan, Ohio and Western Pennsylvannia and even a VE3 on 439.25 Mhz. Horizontal polarization dominates the midwest ATV scene. See you on an opening!" - W9ZIH Chicago

"After some 15 years of informal association, the South Australian Amateur Television Group has become a formally constituted body. A quarterly published periodical newsletter called "The ATV'er" is available and exchange of videotape programs encouraged by all ATV'ers. Address all information to: Secretary, South Australian ATV Group, John F. Ingham, 37 Second Ave, Sefton Pk South Australia 5083. There are 7 ATV Repeaters in Australia. More information follows."

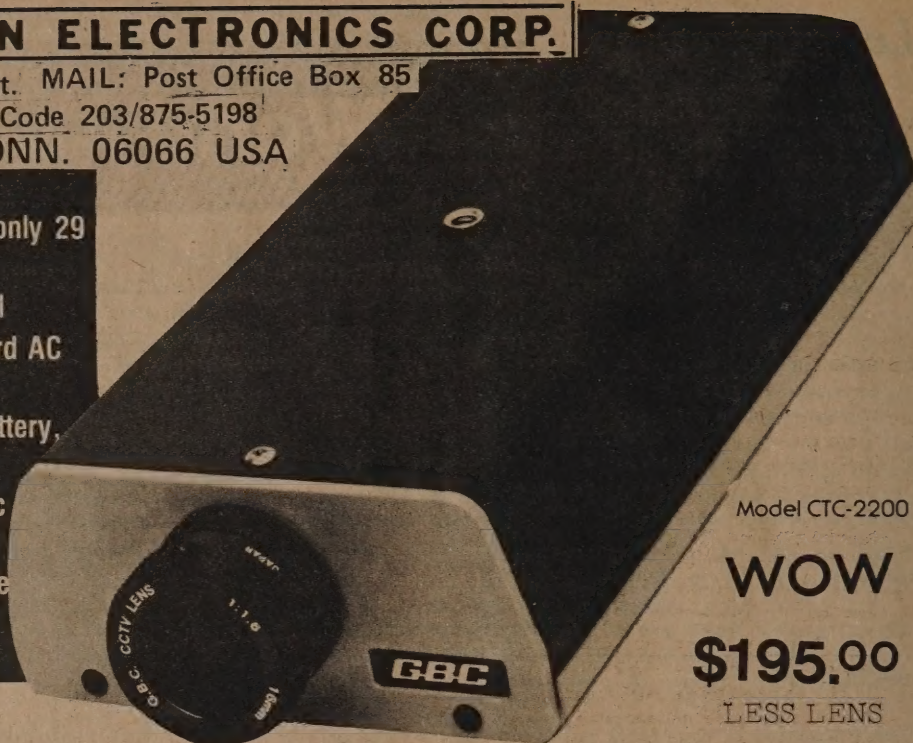
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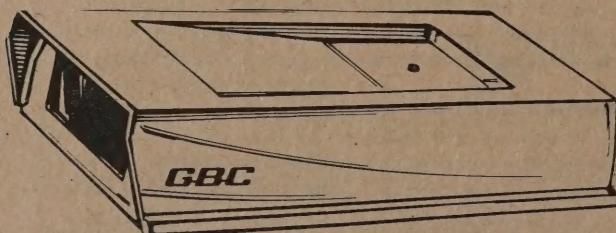
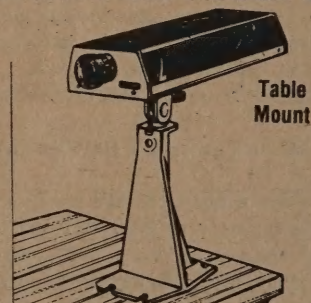
#10,100 - GBC Model CTC-2200 Mini-Max VI 2 to 1 interlace camera. Lightweight, compact operates from standard AC outlet or DC (battery, car, van, boat). 10,000 to 1 ALC. Dustproof, moisture resistant case. 550 lines resolution; Video Bandwidth 7 MHz; Video Output 1.0V pp composite. 8 5/8"L 4 4/8"W 2"H, wt. under 2 lbs. \$195.00 (less lens).

Camera may be mounted from either top or bottom with 1/4/20 thread screw. Standard C mount for lens.

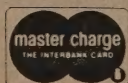
#10,102 - 16mm F1.6 lens, adjustable focus - no iris. When purchased with above camera only \$24.95

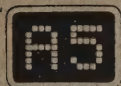
#10,103 - Model LWA-2007 Wide angle lens converter screws into front of above lens converting it to a 8mm F1.6 wide angle lens. Sold only with above lens because that is the only lens it will fit. Only \$37.95

#10,101 - WM-36 Wall Mount "three in one" (wall, table or ceiling mount.) Sturdy weatherproof durable camera mount for indoor/outdoor use. Adj. panning head gives camera 360° horiz. & 90° vert. mobility. Can be secured to mounting surface in minutes. Camera easily attaches to locking disk on pan head. 8" long including pan head 1 1/4" wide at pan head base 3 1/2" wide at mounting base. Wt. 10 1/2 oz. Holds up to 5 lbs. \$19.75



#10,104 - LOH-2005 Indoor-Outdoor Camera Housing. Constructed of rugged weather resistant ABS cyclolac material. Housing base is made of lightweight corrosion resistant material. Lens window is scratch resistant glass. Hardware is cadmium plated to resist rust. Tested to withstand temperatures from -30°F to +150°F. Designed to allow for top or bottom mounting. 5 3/4"W 15 3/8"L 3"H, Wt. 1 lb. 4 oz. \$45.00





World News Roundup

FCC Docket 80-252 (announced June 1980) which comprises RM-3239 filed by Robert J. Rochrig for the legal transmissions of Facsimile data and RM-2861 filed by Henry B. Ruh (former editor/owner of A5 ATV Magazine) for the legal transmissions of SSTV, all AM or FM modulated above 3.775 Mhz by all General Class Amateur Operators in the General Class Operating voice-bands has been formally adopted by the FCC with dates of actual operation yet to be determined (160 meters excluded). In remarks by the FCC, the Commission said it agreed that FAX and SSTV emissions do appear to be similar in bandwidth and interference potential, that Amateur Radio Operators have been transmitting these modes for over 12 years with little complaints to voice communications, and the addition of these two modes in expanded form might provide an additional, useful operating mode without any negative impacts on Amateur Radio. The approval means General Class and above operators would be able to operate FAX and SSTV in the frequency bands between 3.775 and 21.450 Mhz, where voice communications is now allowed. The area of Ten Meters and above thru UHF portions is already allowed. As soon as the official operating dates are announced, anticipated "new" calling frequencies will be maintained. Suggested frequencies by A5 ATV Magazine (remarks by users response in the fall of 1980) would be: 21.440, 14.340, 7.290, 3.890. Full discussion on this good news in the March/April issue of A5 Magazine. THANKS! to Bob Rochrig and Henry Ruh for their great persistence

The Federal Communications Commission has authorized the establishment of experimental radio beacons on the new Amateur Bands 10.100-10.150, 18.068-18.168, and 24.890-24.990 Mhz. The purpose of the experiments is for propagation study and to simplify the changeover of the frequencies. Two emission types, three operating modes and two time phases will be tested. The FCC authorized experimental station call-letters are KK2XJM and QSL via W4MB, R.P. Haviland, 2100 South Nova Road, Box 45, Daytona Beach, Florida 32019.

From WORLD RADIO NEWS comes word of a Midwest RTTY Net that meets daily at 0330 UTC on 3.630 Mhz, with an alternative frequency of 7.090 Mhz. For more information contact the net manager, Bill Wright, 1758 West Gaubert Street, Louisville, KY 40310 (Stark Rtty Group, Massillon, Ohio).

VHF/UHF CONTEST PAPER Bob Heil, K9EID reports in WORLD RADIO that Curt Roseman, K9AKS is now publishing a new VHF/UHF contest bulletin. Curt is getting help from well known contesters such as Mike Owen, W9IP; Emil Pocock, W3EP; Jim Roseman, W9UD; and Charles Wilson III, W0OUH. Send \$1 to K9AKS, 503 E. California, Urbana, Illinois 61801. (Marissa ARC Harmonics, Ill.)

METROPLEX KEEPS GROWING as reported in WORLD RADIO as they have several 440 Mhz. systems for the phone users linked into two-meter outputs. The New Jersey organization recently announced that work has begun for the addition of a two-meter Rtty system as well as a 70CM ATV REPEATER! Interchange with other clubs and groups is encouraged. Write to Metroplex, Box 237, Leonia, NJ. 07605

EASTERN IOWA/WESTERN ILLINOIS ATV group recently published their newsletter "SYNC BUZZ" and has a membership growing to 25 now. Emphasis was on DX'ing with FSTV with the recent changeover to horizontal polarization and the use of many multi-element beams and linear amplifiers. Schedules are being conducted in the late evening and early morning hours in the Iowa/Illinois/Missouri and Minnesota area. WD0EKP in Cedar Rapids has been monitoring DX-TV activity for quite sometime to best follow propagation patterns at 439.25 Mhz. Other DX-ATV'er are W0WOW and WA0INC of Waterloo, W9ZIH and WA9EUN near Chicago, WB0QCD at Lowden, Iowa and WA9HUY in Niantic, Illinois.

EYEWITNESS NEWS KTVK-TV Phoenix had a feature spot October 27th on Chuck Hilliker, W7KIV and Roland DuFault, K0JOA, both are members of Arizona Amateurs on Television Club. 434 Mhz. Color ATV transmissions were exchanged promoting Amateur Television in the Phoenix area. TNX N7AFM!

CLEARWATER, FLORIDA HAS NEW ATV REPEATER underway says WB4BNJ Mike Silvernail of Silvernail Electronics. Input will be 439.25 Mhz, with an output of 477.25 Mhz. Output of the new ATV repeater is between 30-40 watts. They are using an omnidirectional antenna with 6 dbi at an elevation of 120 feet asl. The UHF video signal must have video present to key the repeater. The CW ID is on the FM carrier and the 4.5 subcarrier. Description of the repeater package is elsewhere in A5 Magazine. Contributors to the system were K4CNP, K4ACE, K4OQ, K4DPH, WA4AIE, WB4BNJ and Bob Roskamp.

ROBOT 70 owners might be interested to know that Bob Schoelman, WA7MOV has built up a working converter for the unit that allows the reception of weather pictures. Bob is on 7170 at 9:30 PDT on Sunday mornings with the "Weather Satellite Group". Bob's address is 2310 St. John's Road, Phoenix, Arizona (602-942-6293). Thanks for the information Jim Combs.

INTERNATIONAL WAS SSTV CONTEST is scheduled for February 13th and 14th, 1982 on all standard SSTV frequencies. See inside announcement in A5 Magazine January/February issue!

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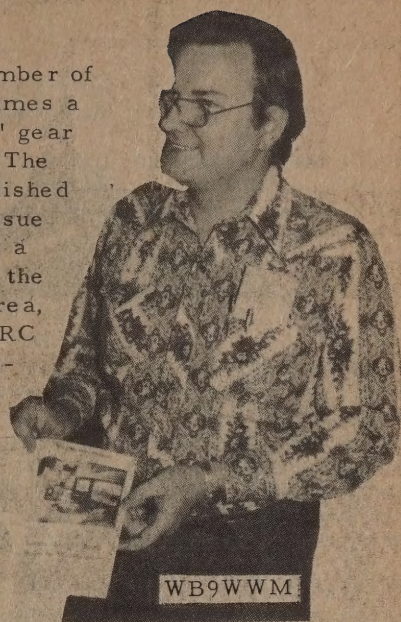
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HISTORY OF A5 MAGAZINE

1967 TO 1982

Volume 1 #1 of A5 AMATEUR TELEVISION MAGAZINE came out in September of 1967 published by WB2SZW Martin Balk and WB2UMF Donald LeWine 6 times a year from Milford, New Jersey. Basic ATV information and "homebrew" gear was reported for Amateur Televisions' first news periodical in the U.S. The publication was discontinued in 1971 for a short period of time until republished by Ron Cohen, K3ZKO with Volumes 2-3-4 beginning with the May/June issue 1972. The 5X8" size was popular with other magazines and was printed by a large VHF Club in the NE. Al Lipkin was the Associate Editor and "ran" the presses, Repeaters were at that time only allowed in the 442-450 Mhz. area, W4BYG in Atlanta was building up a repeater, later on the Great Lakes ARC claimed to be on the air on 437.25/425.25 Mhz, W6ORG's callsign was beginning to get familiar for ATV articles from Temple City, CA., the T44 Motorola rig was the fancy with WA3AXV first articles on how to use them for ATV work. Bob Stone, W3EFG received a patent medallion for his invention of Sampledot (NBTV) from GE Corp., and was later to publish an article on converting FSTV to SSTV mfg. by HAL CO.

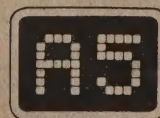
First advertising supporters of A5 Magazine were PC, Denson, Janel, ATV Research, Ham Buerger, CCTV Center, SCAL ATV Club, HDL, Spectronics and Hamtronics. The first 2-way SSTV contact on Oscar 6 W9NTP-WA9UHV was completed as Cop Macdonald, WA2FLJ was writing a regular column for CQ Magazine on SSTV and Amateur use. Publication stopped with the March 1974 issue. Henry Ruh, WB9WWM in Michigan came out with the first issue of Volume 5 in January '75 and continued for 6 1/2 years thru Volume 11-1981. Henry brought the "professional" touch to the periodical by enlarging the size to its' current 8 1/2 X 11" format, hired commercial printing in Topeka, KS. & a mailing service. Color issues were printed with more photographs of operators, projects, kits and all gear available. A5 Magazine became a voice of ATV'ers as Henry pursued issues to the ARRL and FCC. A5 Magazine and ATV IN A NUTSHELL publications were accepted by the U.S. Library of Congress in Washington, D.C. Subscriptions became worldwide with regular column editors and writers. A5 Mag. became present at many Amateur gatherings, hamfests and meetings nationwide including a regular appearance at the large Dayton Hamvention in April at Dayton, Ohio. Mike Stone, WB0QCD became a 2nd authority on SSTV A5 operation with regular columns beginning with the Full Color March/April issue of 1980. Henry Ruh became more and more dependent on his new job in Des Plaines, Ill. and decided to put A5 Magazine up for sale in May of 1981.



A5 MAGAZINE SOLD TO WB0QCD

TRADITION TO CONTINUE WITH EXPANDED FORMAT

The September/October issue of 1981 announced the selling of A5 Magazine to Mike Stone, WB0QCD of Lowden, Iowa. An expanded "format" was introduced including other modes of Amateur Specialized Communications such as SSTV, RTTY, EME, UHF and Microwave Communication techniques on a regular basis. The magazine grew immediately in the number of average pages to 48 with a "renewed" emphasis on ATV as the "heart" of the publication. The November/December 1981 issue was declared an SSTV special annually with more news, pictures, articles, advertisers and contests. The subscription and cost of publishing was reviewed with the first increase in many years to \$10.00 per year. Future plans are for larger paged issues and perhaps even more frequent publication. ATV IN A NUTSHELL Part Two is underway with a continuous growing readership worldwide. A5 Magazine celebrates its' 15th year of publication-serving the "Specialized Communication Radio Amateur" worldwide.



How to Get Started on Fast Scan ATV

FSATV really is not much different than any other mode or getting on another band. It takes another rig and antenna system plus the incentive to communicate with another ham interested in the same mode. Try to find a buddy ham or find others in your area that are on ATV or are interested in getting on. Put the word out thru your local clubs or ARRL SCM. 146.43 FM simplex is the national FSATV coordinating frequency. This frequency is very important, especially when getting started, to discuss your progress, rotate beams, and talk in the picture. Generally if you can work someone on 146.43 FM simplex you can get pictures on ATV from them. Later, 146.43 is used to talk back to the video transmitting station at the same time he is talking to you on the sound subcarrier. 439.25 is the most used video frequency, and 434 is used in the more populated areas that have a few UHF FM repeaters on the air. Most start with a downconverter to SEE the activity.

BUILD OR BUY? If you are more into operating and can't wait to televise your shack, video tapes, computer games, etc. then you will probably want to get the complete unit ready to go . . . TC-1 Transmitter/converter. If you enjoy putting your own system together then the four basic modules are for you. Later you may want to add some of the various accessories.

But either way the most important part of your system is the antenna and transmission line. We suggest the 48 element J beam either single or dual up at least 40 feet or above the tree tops as far as practical. Foliage really absorbs 400 mHz RF. Coax also has a lot of attenuation. Belden 8214 has the lowest loss of all the 1/2" coaxes at 3.7 db/100. RG 213 is 4.7 db. Use 50 ohm hardline for runs over 75'. Take great care in making the connectors properly and then tape and spray with clear epoxy paint to keep the water out of the coax. Verticle polar-

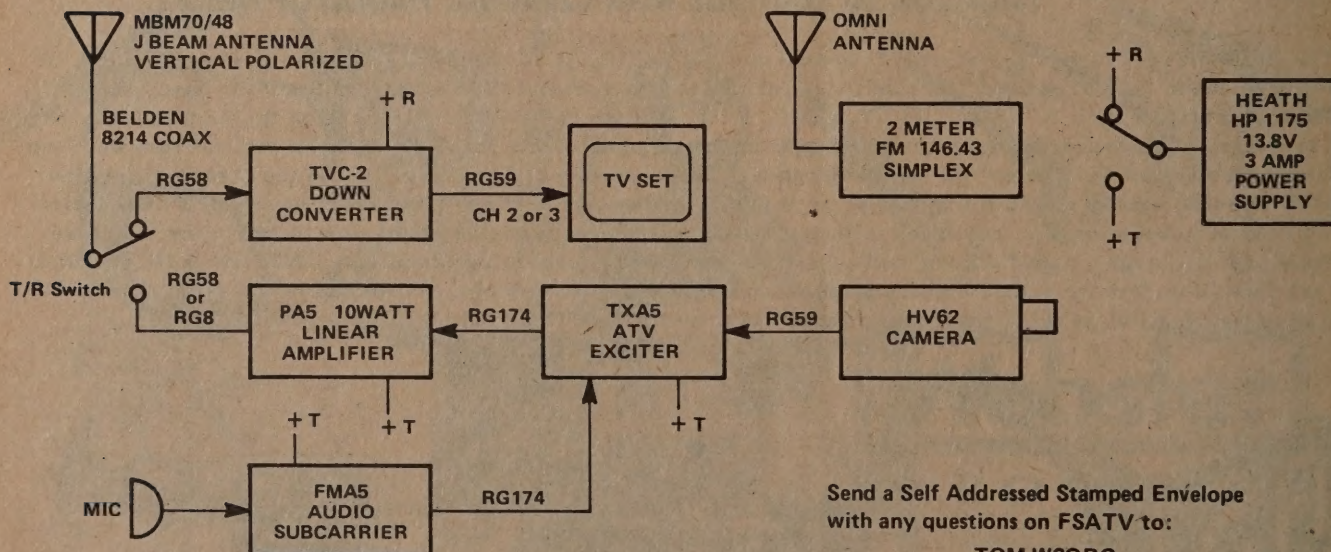
ization is recommended as you may want to get a repeater later and it is hard to get a horizontal omni gain antenna.

At UHF frequencies all coax connections must be as short as possible. The center conductor should never be longer than 1/4" out of the cable for connection. Its usually a good idea to shield the FMA5 and the TXA5 in separate boxes to keep the RF out of the mic amp. Use a good T/R relay such as the Magnacraft W120X-14 or Dow-Key type 60 or pull one out of an old surplus UHF FM transmitter. The relay must be made for UHF and low VSWR.

CONNECTING TO THE TV SET. Many TV sets have a hot chassis. Check with a ohmmeter between the AC cord and TV chassis. If one side shows low resistance with the switch on the set ON, you will need to make sure the TV will be isolated from the converter and antenna ground or sparks will fly! If the set does not have a F connector antenna input, add one per the instructions on the converter sheet. Fine tune the TV on the open channel 2 or 3 to minimize interference and then tune the downconverter for a picture. The TVG-1 ATV test gen is handy if you want a ham close by within 1/2 mile to send you a signal.

ADDING ON TO THE SYSTEM. There are accessories for monitoring your own xmited video, modifying a TV into a monitor, adding S-meter and squelch to the TV receiver, video IDer and clock, a board to super-impose your microcomputer on the camera video, black & white and color cameras. Show your video tapes by just connecting the video output jack of your VCR to the video input of the xmtr. Aim the TV camera at the projection screen to show your home movies. Make your station run on 12VDC for mobile, and or use atv for public service events like parades and races. Let your imagination go!

MODULAR ATV SYSTEM BLOCK DIAGRAM



Send a Self Addressed Stamped Envelope with any questions on FSATV to:

TOM W6ORG

P.C. ELECTRONICS

2522 PAXSON LANE • ARCADIA, CA 91006

(213) 447-4565

FAST SCAN ATV

ALL YOU NEED IN ONE BOX



Connect to the ant. terminals of any TV set, add a good 450 antenna, a camera, and you are there . . . Show the shack, home movies, computer games, etc.

FEATURES

- 10 WATTS RMS OUTPUT ON SYNC. DC RESTORED MODULATOR.
- STANDARD FREQ. AVAILABLE: 439.25, 434.0, AND 426.25 MHZ SPECIFY XMTR FREQ. AND DOWN-CONVERTER OUTPUT ON CHANNEL 2, 3, OR 4.
- BROADCAST STANDARD 4.5 MHZ SUBCARRIER SOUND WITH HIGHGAIN MIC AMP.
- 8 MHZ BANDWIDTH MODULATOR FOR HIGH RESOLUTION VIDEO, COLOR, AND COMPUTER ALPHANUMERICS.
- BUILT-IN REGULATED AC POWER SUPPLY.
- TUNEABLE DOWNCOVERTER COVERS 420 to 450 MHZ. CONTAINS LOW NOISE .9db NE64535 PREAMP, PLUS HOT CARRIER DOUBLE BALANCED MIXER.
- STILL \$399 DELIVERED USA VIA UPS. TWO FOR \$750, OR 5 OR MORE 10% OFF.
- * MOST TC-1s SHIPPED FROM STOCK IN 5 DAYS ON CREDIT CARD OR POSTAL MO.

Our terms are Visa or Master Charge \$25 min. by phone or mail, or check or money order \$5 min. by mail. We do not believe in surcharging hams the cost of unnecessary paperwork from purchase orders, CODs and their returns from unhappy housewives, or unpaid invoices, or dealer markups. We try to give you the lowest price possible to promote Fast Scan ATV.

*depends on options ordered.

OPTIONS

- DM-1 RF/VIDEO DETECTOR MONITOR INSTALLED WITH BNC OUTPUT . . . \$30
- TWO FREQUENCY EXCITER INSTALLED WITH XTALS ON 439.25, 434.0, OR 426.25. NOT AVAILABLE WITH CA-1 . . . \$30
- SET UP TO DRIVE MIRAGE D1010 AMP WITH SYNC STRETCHER PARTS PUT INTO TXA5 AND ADJUSTED FOR 90 WATTS PEP . . . \$50
- MIRAGE D1010 LINEAR AMP W/"N" CONN . . . \$299
- PROVISION FOR EXTERNAL 12 TO 14 VDC FOR MOBILE OR PORTABLE . . . \$30
- ON CARRIER AUDIO MODULE CA-1 INSTALLED FOR THOSE AREAS THAT DO NOT USE STANDARD SUBCARRIER OR TWO METERS FOR AUDIO . . . \$50

★ IF YOU WISH TO BUILD YOUR OWN SYSTEM, SEE THE BASIC 4 MODULE PACKAGE.

P.C. Electronics, 2522 S. Paxson Ln., Arcadia CA. 91006

8am-6pm PST

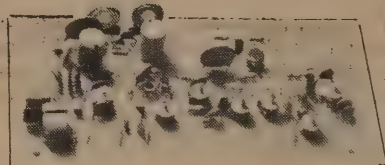
TOM W6ORG
MARYANN WB6YSS
213/ 447-4565

P.C. ELECTRONICS

NOV 81 CATALOG OF PC BOARDS AND MODULES FOR YOUR COMMUNICATIONS SYSTEM

Solid State Fast Scan ATV Modules

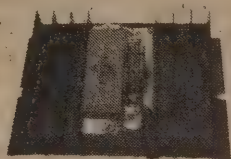
The Basic Four Modules



1. TXA5-4 ATV EXCITER/MODULATOR \$89 ppd

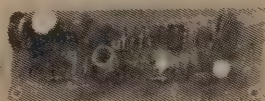
This wired and tested module is designed to drive the Motorola MHW-710 module in the PA5 10 watt linear amp. The crystal in the 100 mHz region keeps harmonics out of two meters for talk back. The video modulator is full 8 mHz for computer graphics and color. Requires 13.8 vdc reg @ 70 ma. Tuned with xtal on 439.25, 434.0, or 426.25 mHz. Provision for sync expanding.

Two Frequency Exciter \$115 ppd
Sync Expander installed add \$30 ppd



2. PA5 10 WATT ATV POWER MODULE \$89 ppd

The PA5 will put out 10 watts RMS power on the sync tips when driven with 80 mw by the TXA5 exciter. 50 ohms in and out, plus bandwidth for the whole band with good linearity for color and sound. Requires 13.8 vdc regulated @ 3 amps. MHW-710-2 \$60 ppd



3. FMA5 AUDIO SUBCARRIER GENERATOR \$29 ppd

Puts audio on with your camera video just as broadcast TV does at 4.5 mHz. Puts out up to 1 v p-p to drive the TXA5 or VM-2, 3, or 4 modulators. Requires low Z mic (150 to 600 ohms), and +12 to 18 vdc @ 25 ma. Works with any xmtr with 5 mHz video bandwidth.



4. TVC-2 ATV DOWNCONVERTER \$55 ppd

Stripline MRF901 (1.7 db NF) preamp and double balanced mixer module digs out the weak ones but resists intermods and overload. Connects between uhf antenna and TV set tuned to channel 2 or 3. Varicap tunes 420 to 450 mHz. Requires +12 to 18 vdc @ 20 ma. Super sensitive TVC-2L with NE64535 preamp (.9db NF) stage ... \$69 ppd



TVC-4 ATV DOWNCONVERTER \$89 ppd

This is a packaged version of the TVC-2 converter with internal power supply. Has BNC input and F output connectors.

Also available with the NE64535 (TVC-4L) \$105 ppd
Size: 5 1/4 X 2 1/2 X 7 inches.

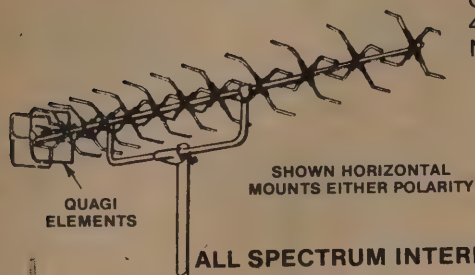
..... Package Specials

TXA5, PA5, FMA5, and TVC basic module package \$249 ppd

OPTIONS: 2 frequency exciter add \$26
NE64535 low noise downconverter add \$15
Packaged TVC-4 downconverter add \$34
NEW → Magnacraft W120X-14 coax relay add \$41

10% discount on 5 or more of one module ordered at one time to one address.

J Beam MBM48/70cm ANTENNA ONLY *\$75.75



One of the few antennas that have enough bandwidth for ATV... 3 db down at 420 and 450. Covers simplex and Repeater frequencies with no sacrifice. No balun to buy.

- 15 dbd. 48 elements.
 - 6 foot boom length.
 - Direct 50 ohm coax feed.
- *cod or charge card only due to added UPS shipping charges
- | | |
|------------------------------------|-----------|
| mbm88/70 88 element | *\$105.50 |
| pmh2-70 dual phasing harness | *\$ 16.65 |
| mf2-48 vert stacking frame | *\$ 14.00 |

ALL SPECTRUM INTERNATIONAL PRODUCTS CAN BE ORDERED THRU P.C. ELECTRONICS

AEA 450 ISOPOLE OMNI GAIN ANTENNA \$65 delivered.

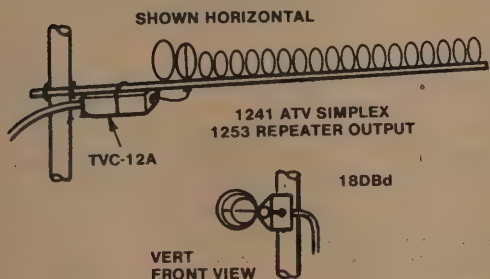
High efficiency decoupling cones puts the all the RF on the horizon where it counts. Great for local ATV round tables, or public service portable work, separate sound subcarrier transmitters, FM remote base and repeaters. Ready to connect to your coax N connector and 1 1/4" mast. Low wind loading and DC grounded for ruggedness.

1200 MHZ ATV SYSTEMS

Use 1278.75 mHz as a duplex atv freq. with others on 439 or 434 mHz by just adding a MMV1296 varactor tripler and 1296-LY loop yagi to your 10 watt transmitter on 426.25 mHz. As long as the 400 and 1200 mHz antennas are more than 5' apart no special filters are needed. To receive just add a 1296-LY loop yagi and the TVC-12a downconverter. Other uses are crossband repeaters to see your own video coming back, repeater links and remote bases, weather radar video, site security, etc.

TVC-12a 1215 to 1300 mHz DOWNCONVERTER \$89 ppd

Sensitive NE 64535 preamp stage, remote varicap tuned, downconverts to TV channels 7 or 8. Mounts on 1296-LY antenna to save feedline losses. Requires simple 11 to 18 volt at 20 ma supply made from Radio Shack parts to tune thru IF coax line.



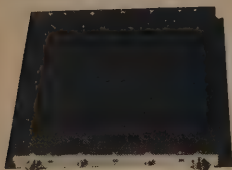
1296-LY LOOP YAGI ANTENNA *\$64.70 + UPS

18 dbd gain and full bandwidth on a 7 ft boom. With N connector.

MMV1296 VARACTOR TRIPLER \$113.45 ppd

Triples ATV, AM, or FM to the 1200 mHz band with 60% efficiency. 20 watts max drive, and no power supply required.

BUILD YOUR OWN ATV REPEATER WITH THESE BASIC MODULES:



PSF438-ATV INTERDIGITAL VESTIGIAL SIDEBAND FILTER \$131.50 ppd
5 mHz bandwidth for good color and sound but rejection for no desense. Copper plated 7 pole for typ 1.3db insertion loss.

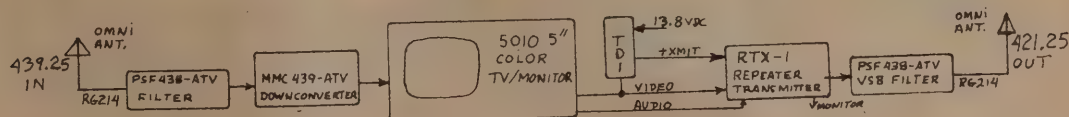
MMC439-ATV CRYSTAL CONTROLLED DOWNCONVERTER ch3 IF \$72.45 ppd
.. 45.75 mHz IF \$77.45 ppd. Low noise MRF901. 30 db gain.

5" LIBERTY MODEL 5010 PORTABLE COLOR TV/MONITOR ^{NEW!} \$299 ppd

TD-1 TONE DECODER. Detects horizontal sync to key xmtr. pc board \$5.



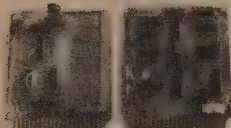
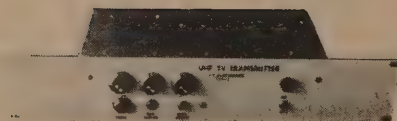
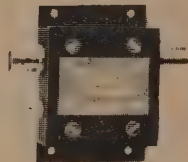
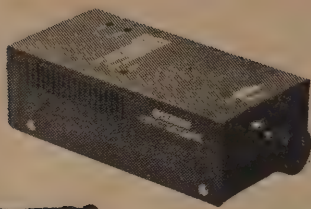
RTX-1 ATV REPEATER TRANSMITTER MODULE ^{NEW!} \$325 ppd
Contains sync equalized TXA5 exciter, FMA5 sound subcarrier, MHW710-2 10 watt power module, and DM-1 Dector/Monitor in a shielded diecast aluminum box.



SEND SASE FOR COMPLETE REPEATER INFO including ready to go ATVR-4 for \$2499, adding special effects, mixing two meters, getting rid of desense and interference from other transmitters at the same site, etc.

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VIDEO EQUIPMENT



HITACHI HV-62U BLACK AND WHITE CAMERA\$205ppd

High performance CCTV camera great for ATV or surveillance. 500 line resolution, 10,000:1 auto light compensation. C mount 16 mm F1.6 lens included. 117 vac at 7 watts. small 4 x 2.7 x 8 inches.

HV-62SU externally syncable, 2:1 interlace version.....\$299ppd

WIDE ANGLE LENS HF-9A 9mm F1.4 C-mount.....\$75ppd

TELEFOTO LENS HF-35A 35mm F1.7 C-mount.....\$75ppd

ZOOM LENS H5X14C 5:1 14-70mm F2.0 C-mount.....\$204ppd

HITACHI GP-41D TRI-ELECTRODE

PORTABLE COLOR CAMERA.....\$869ppd

6:1 power zoom 14-84mm, auto iris, F1.6 lens with macro focus for close-ups. 1.5" electronic viewfinder. Boom microphone. Full range variable color temperature control. Superior color and low light sensitivity to 75 lux. 12vdc (6.7 watt load) to 117vac adaptor, AP-4.....\$55ppd

HITACHI GP-6M SATICON PORTABLE

COLOR CAMERA\$1129pd

6:1 two speed power zoom 12.5-75mm, auto iris and macro zoom F1.4 lens. 50 lux low light sensitivity. Tilttable 1.5" electronic viewfinder. Full range color temperature control, fade in and fade out control, and a boom mic. 12vdc (8.5 watt load) to 117vac adaptor, AP-4.....\$55ppd

5" COLOR AC/DC PORTABLE TV/MONITOR\$299ppd

Liberty model 5010 has video and audio inputs and outputs Use as a color video monitor, standard TV, VCR tuner, or repeater receiver. Operates on 117vac, external 12vdc, or internal D cell batteries (not supplied). 12 x 12 x 6"

P432VD ADVANCED RECEIVER RESEARCH

RF PREAMP.....\$33ppd

Low noise MRF901 420-450 mHz 15 db gain preamp. Metal case with BNC connectors, req. 11 to 16 vdc at 6 ma. Really makes old UHF TV tuners come alive.

P432VD/NC MRF901 preamp pc module only\$26ppd

P432VDA extra low noise NE64535 preamp\$50ppd

P432VDA/NC NE64535 preamp pc module only\$43ppd

PCH3VD TV channel preamps. Specify any TV channel from 45 mHz IF thru ch 13. Its better to add a IF amp to a low gain TV set than risk inter mod with another preamp if the converter has a low noise preamp\$30ppd

Ask about other Advanced Receiver Research products!

TVX-1 TELEVISION TRANSMITTER\$500ppd

This is a complete 10 watt UHF TV transmitter in a 3 1/2" high 19" rack panel intended for community television outside the USA. Available on TV channels 14 thru 20 or on ham ATV frequencies. Takes baseband video and line level audio input from a TVRO, VCR or camera. Also a mic input for voice overs. 117vac 60 hz supply. Monitor output. 4 to 6 week delivery depending on frequency. Not FCC type accepted for use in USA. Call for details and options

VIDEO SPECIAL AFFECTS:

Family of plugin cards designed to superimpose characters, supply external sync, and other effects to be added later. Start your effects cardage now with the VDM-3 and VID-3.

VDM-3 VIDEO DISPLAY MIXER 2 camera switcher, superimpose mixer, V & H drive outputs, and raster gen.....\$69ppd

VID-3 VIDEO IDENTIFIER Superimposes call or any 6 letters in camera video. 1 programmed PROM included. Works with VDM board. A must for repeaters\$69ppd

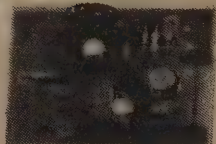
IDS-3 ID SEQUENCER steps thru up to 5 PROM ID memories to show call, city, CQ, repeater, etc\$49ppd.

additional programmed PROMS \$15ea



MML432-50

D1010



DM-1



TVG-1



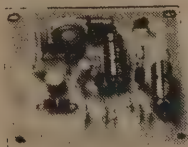
TVG-12



VM-3



VM-2



VM-4

D1010-N MIRAGE ALL MODE 100 WATT AMPLIFIER....\$299ppd
420 to 450 mHz, FM, SSB, CW, and ATV. Up to 90 watts pep on ATV with only 4 watts drive. Req. 13.8 vdc reg. at 20 amps. Uses "N" connectors. 12" x 3" x 5 1/2".

MML432-50 MICROMODULES 50 WATT AMPLIFIER...\$269.95
+ UPS

All modes, builtin low noise preamp, 5 in/40 pep out on ATV. Req. 13.8 vdc reg. at 8 amps. BNC connectors. 1 1/2" x 5" x 2.2". Charge card or COD only on this unit.

DM-1 RF/VIDEO DETECTOR & MONITOR.....\$20ppd.
Samples RF off xmtr coax and outputs 1 v p-p video to monitor your own camera and setup. Also outputs to a external 50 uA meter for relative power. Req. +12 to 18 vdc at 25 ma. PC board only\$ 5ppd.

TVG-1 and TVG-12 ATV TEST GENERATORS\$15ppd ea.
Connect your camera and you have about one milliwatt on the air for demos, ant tests, or receiver alignment. Req. 9vdc at 7 ma. TVG-1 tunes 400-480 mHz and TVG-12 tunes 1200-1300 mHz.

TSQ-1 TV S-METER AND SQUELCH BOARD\$5ppd
Add common or Radio Shack parts, tap into TVs video IF AGC line, break one speaker lead, and you can better align the antenna, give relative signal reports, and have no noise between contacts.

VM-2 TUBE TYPE XMTR MODULATOR.....\$20ppd
Grid modulates tetrodes:5894, 6907, 6524, and high power 4 X 250 and 8930s. Req. extra 2N3738 for high power\$5

VM-3 1 WATT TRANSISTOR XMTR MODULATOR\$20ppd
For VHF Eng., Hamtronic, GLB, etc. transistor exciters. SS-1 SYNC EXPANDER for driving high power transistor amps\$17ppd.

VM-4 2C39 TRIODE CATHODE MODULATOR\$25ppd
Get full color and sound on 400 & 1200 mHz amps.

REPLACEMENT PARTS AND ACCESORIES

MRF901.....	10 for \$20	Bare PC boards.....	at \$5 ea:
NE64535.....	2 for \$25	TSQ, VM-2,3,&4,DM-1,VA-2,	
2N3738.....	2 for \$10	TXA5 exciter crystals.....	\$15
2N6424.....	2 for \$10	Magnacraft W120X-14 T/R relay.....	\$41
LM350 3 Amp regulator.....	\$10	CX-600N .5Kw type N coax relays.....	\$65

All our manufactured modules can be serviced by us for \$15 plus parts cost. TC-1s are \$30 plus parts. Call or write for return authorization or repair assistance.

TERMS: Unless otherwise specified: Visa and Master Card orders by phone or mail \$25 minimum. Check and Postal Money orders by mail minimum \$25 shipping paid, under \$25 add \$2 shipping and handling. No CODs or purchase orders accepted. In stock items normally shipped within 5 working days after receipt of order with charge card and US Postal money orders. All other checks up to 15 working days to clear. Our ppd prices are sent UPS brown or 1st class mail at our option within USA. Foreign Air Parcel post and other shipping charges are extra, inquire for costs. Valid ham call letters required by us for purchase of transmitting equipment for use in USA.

ORDER FORM



QTY.	MODEL #	DESCRIPTION	PRICE	TOTAL

(CALIF. ONLY) SALES TAX 6%

TOTAL

NAME _____ CALL _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

MASTER CHARGE OR VISA No. _____

BANK No. _____

EXPIRATION DATE _____

CALL 8am-6pm M-F

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This article first appeared in **HAM RADIO MAGAZINE** January 1980 and is reprinted for **A5 ATV Magazine** readers with permission of W6NIF



video console for ATV

A project for
Amateurs interested
in improving
their fast-scan
television stations —
three video generators,
a special-effects generator,
and a simplified form of
Gen-Lock are described

The video console project began after I'd completed a solid-state ATV transmitter. I had no way of knowing how it was performing except by having other ATVers try to "talk me in" on alignment. I soon learned this was almost impossible.

I discussed my problem with Bill Parker, W8DMR, another ATV ham, and he suggested that I needed a few test generators. So I consulted *A5* magazine and found articles on two generators.^{1,2} After running some tests and reading a book by Tektronix,³ I found a need for one more generator so that I could check 99 per cent of my new transmitter. I then designed a pulse and bar generator. After this I thought, "Boy, wouldn't it be nice to have some special effects, such as a video switcher." After a short time I had it operational.

the video console

The video console consists of three function generators, a video switcher, and a Glen-Lock circuit. All can be locked to either external or internal sync or to a composite video signal. Everything is contained on five PC boards and powered by a single 12-volt supply.

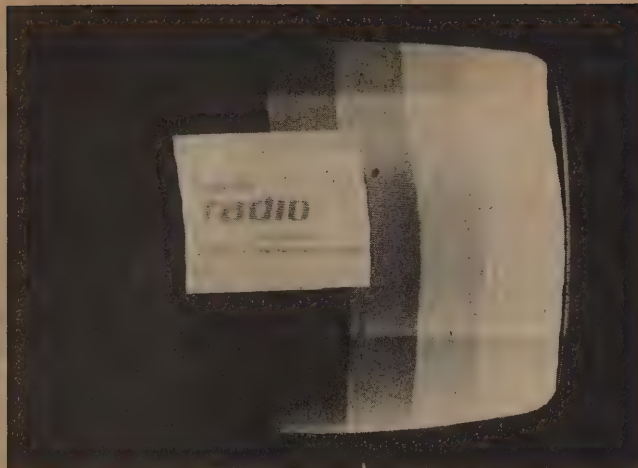
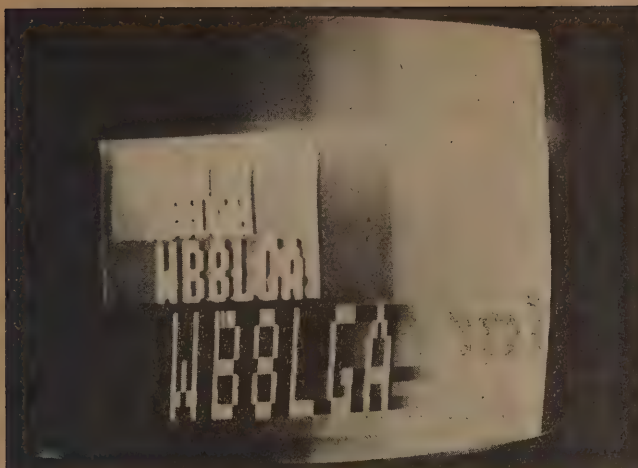
The function generators are multiburst, gray scale, and pulse and bar. The multiburst generator creates a frequency-burst pattern on the TV screen of white to the extreme left followed by a low-frequency signal of 0.5 MHz, then 1.7 MHz and 3.4 MHz signal. The extreme right of the TV screen shows a 4.5-MHz burst frequency (see **photo D**).

The multiburst generator can be used to check bandwidth of video equipment such as amplifiers, TV transmitters and tape recorders. It can also be used with oscilloscopes. Just insert the multiburst generator output into the input of the equipment under test and look at the results on the TV screen or on an oscilloscope (see **photo E**). **Photo F** shows high-frequency rolloff, and **photo G** shows the middle frequencies with too much gain. These test patterns depict only a few of the results, but **photo E** is the best example.

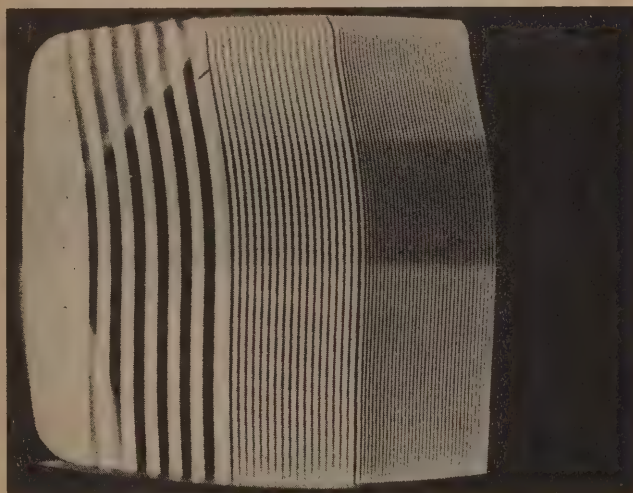
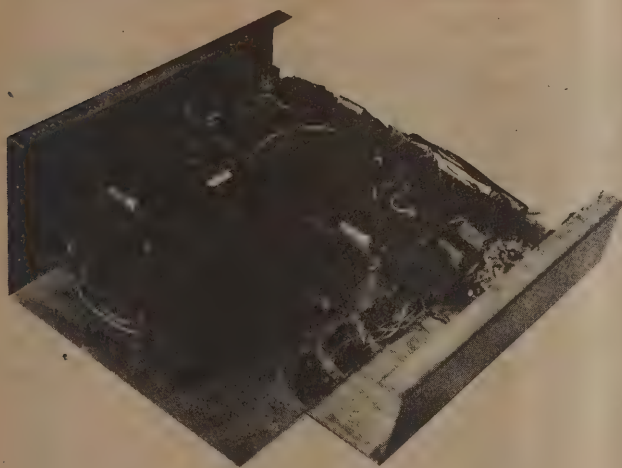
The second generator is a gray-scale (staircase) generator. It produces a pattern on the TV screen, as seen in **photo H** from left to right, in seven shades of gray. The staircase generator is used to check your video-system linearity. It shows if the white or black video is being compressed (see examples in **photos I** and **J**). If you insert the gray-scale generator into a video modulator or other video input, you should see a gray scale as in **photo H**. If you look at the gray-scale generator output on the oscilloscope, you'll see a staircase pattern as in **photo K**.

The third generator is called a "pulse and bar." It produces a white pulse on the left-half, and a white box in the right-half, of the TV screen. Its function is to check for high- and low-frequency bandpass characteristics. The pulse and bar generator output as seen on the TV screen is shown in **photo L**. On an

By Charles A. Beener, WB8LGA, 2548 SR 61,
Marengo, Ohio 43334



Photos A and B: Special effects that can be generated by the video console. Photos by WB8HXR.



Photos C and D: Inside view of the video console, left. At right, multiburst generator output as seen on TV screen.

oscilloscope, you see a wave form as shown in photos M and N.

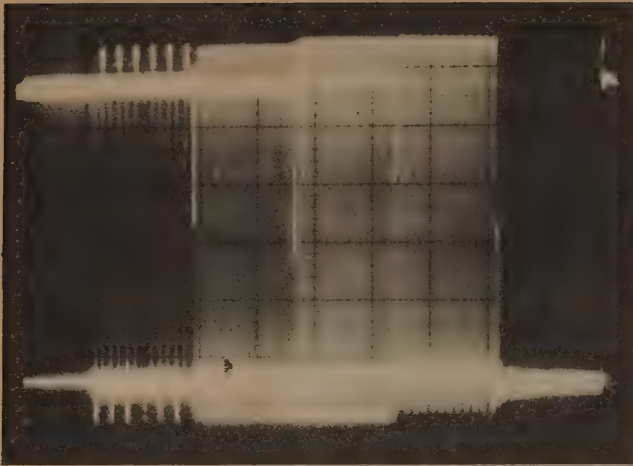
circuit description

The following is a description of the five circuits that compose the video console. They consist of the multiburst generator (A1 board), gray-scale generator (A2 board), pulse and bar generator (A3 board), video switcher (A4 board), and Gen-Lock (A5 board).

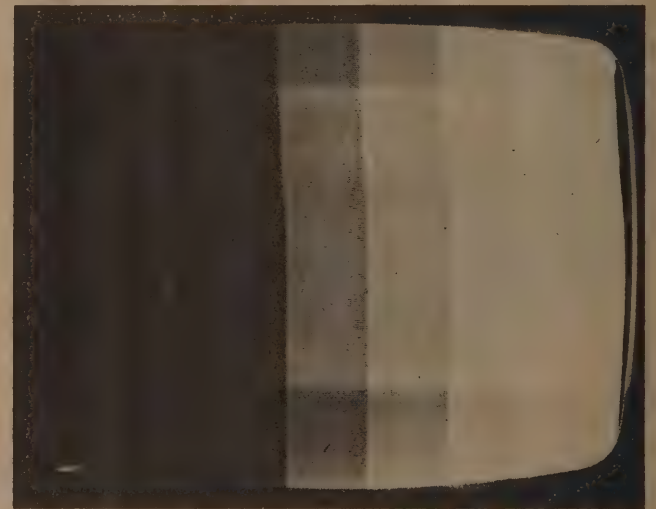
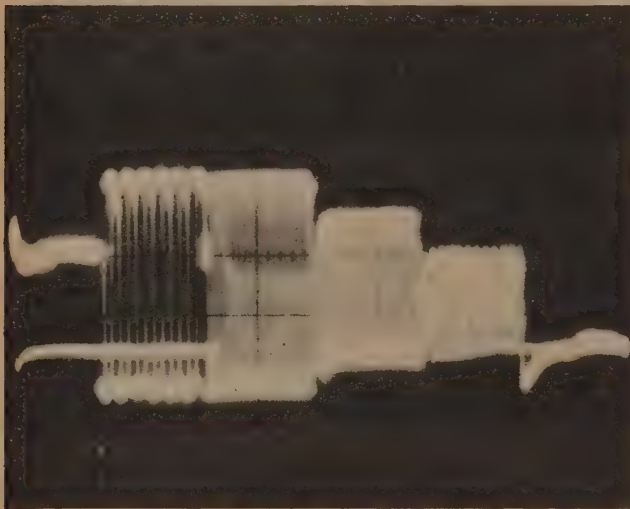
Multiburst generator (A1 board). This circuit is shown in fig. 1. Referring to fig. 1, U9 is a free-running oscillator whose frequency is 3.402 MHz. U9 drives U1 and U2, a divide-by-three counter with an output frequency of 1.134 MHz. U2A drives U2B, a divide-by-two counter whose output is 0.567 MHz. U2B output drives a divide-by-six counter, U3A, U3B, and U4, whose output frequency is 94.5 kHz. This signal drives a six-stage shift register that shifts the gating from left to right on the screen. The five H

signals (fig. 1) drive the five NAND gates, U8A, B, C, D, and U9C. One section of U1A is fed to U1B, a divide-by-two counter with an output of 1.7 MHz. The same signal is fed to U8D. The output of U2A, 1.134 MHz, feeds U9A, which drives U9C. All U8 and U9C outputs are Nanded into U12. They are controlled by H1, H2, H3, H4 and H5, and are turned on, one at a time, by the 6-stage shift register. The sum results in an output from U12 of the first high signal followed by a 0.567-MHz signal, 1.7 MHz-signal, 3.4-MHz signal, then a 4.5-MHz signal. This occurs in 54 μ s. This time, plus that of the horizontal sync pulse, is equal to 63.5 μ s, which is the time required for one horizontal sync line on the TV screen.

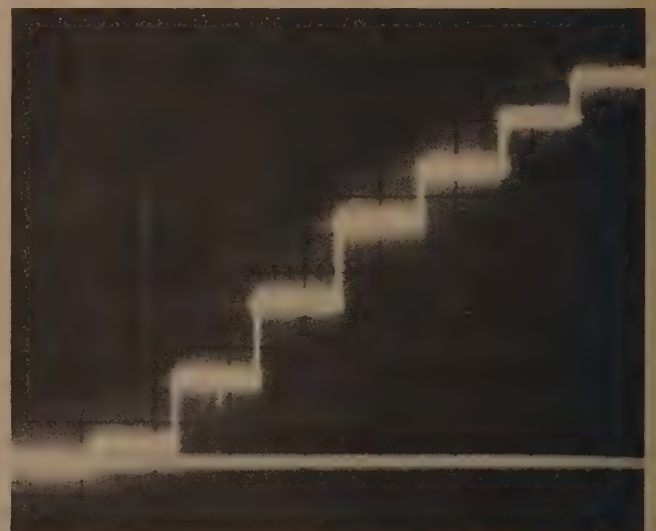
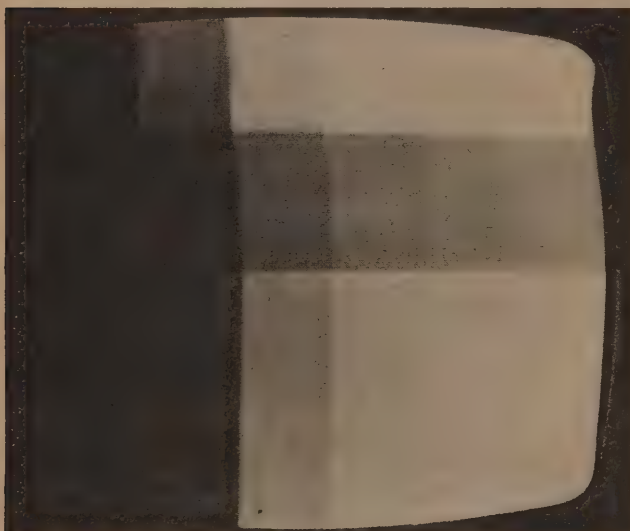
The sequence repeats until a vertical sync pulse appears on U10, pin 1. U10 is a one-shot. U10 provides a 1-ms pulse, which resets the 6-stage shift register at U5A, pin 4. U10 Q output (pin 1) is used for vertical blanking. The output of U7B, pin 6, is a horizontal timing pulse. It is Nanded at U10 pin 1 and is the vertical timing pulse for the composite sync. The



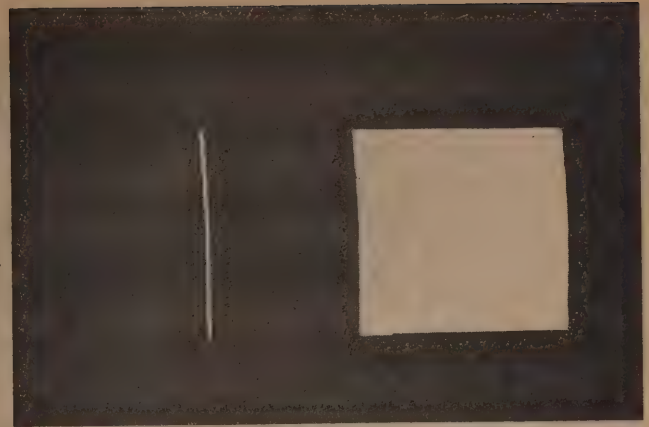
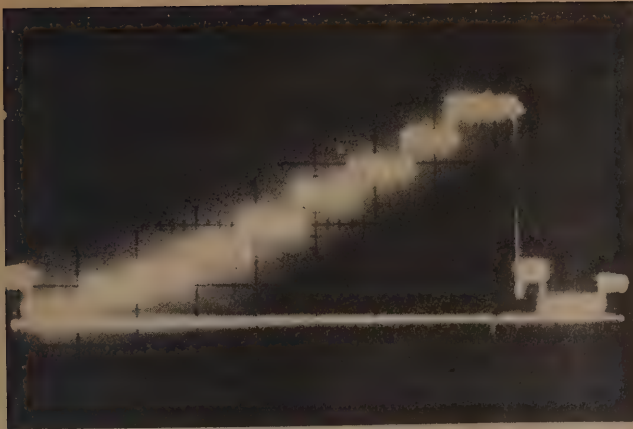
Photos E and F: Oscilloscope test pattern showing output of the multiburst generator, left. At right, multiburst generator test pattern showing high-frequency rolloff.



Photos G and H: Another test pattern of the multiburst generator showing excessive gain at the middle frequencies, left. At right, output of the gray-scale (staircase) generator as seen on the TV screen.



Photos I and J: Gray-scale generator output showing white video being compressed on TV screen, left. At right, oscilloscope test pattern showing gray-scale generator output. White video compressed.



Photos K and L: Gray-scale generator output shown on oscilloscope, left. At right, pulse and bar generator output as seen on the TV screen.

composite video outputs appear at R15.

Gray-scale generator (A2 board). The main oscillator is U1 (fig. 2). Its frequency, 126 kHz, is determined by C1, R1. U1 output is fed to U2, a divide-by-eight counter. Counter output is NANDed at U1A, which drives U1B. This stabilizes the oscillator by the horizontal sync pulses on U2 pins 2 and 3. (U2 is a decade counter.) Each time the horizontal sync appears on U2 pins 2 and 3, the counter is reset to all zeroes. The three outputs from U2 also drive two hex inverters, whose output provides a staircase at the output. (See photo K.)

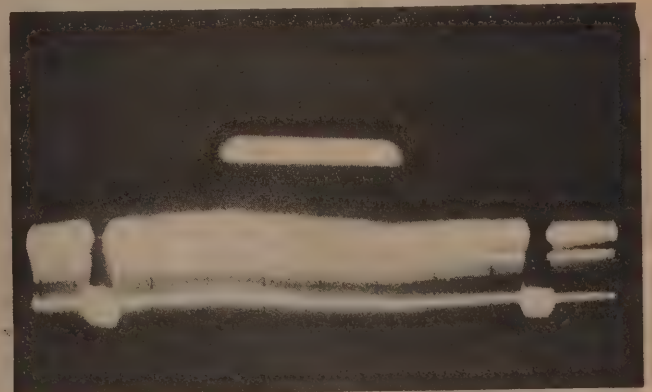
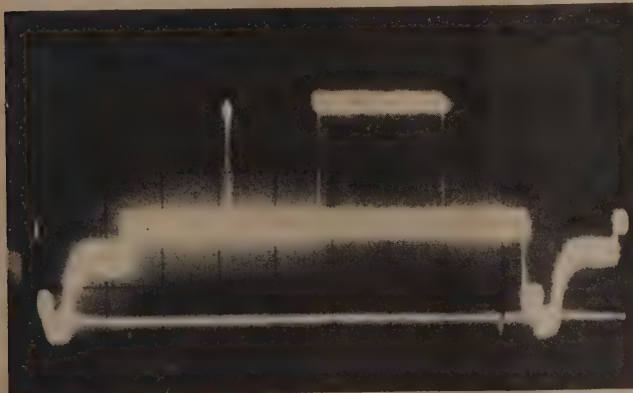
From pin 8 U2 drives U4, pins 3 and 4. U4 is a delay trigger, which drives U5. U5 provides an output 11- μ s wide of horizontal sync. The sync and video are mixed by R9 and by R10, which is the video-output pot. The A2 board also contains the oscillators for the horizontal and vertical sync. These are common NE-555 timers, U6, and U7.

Pulse and bar generator (A3 board). The generator works on the principle of the one-shot delay, using 74121s. The horizontal sync feeds U3, U4, U5 (fig. 2). The time delay is from the horizontal sync

pulse. The amount of delay is determined by the one-shot RC time constant. U3 provides the start of the bar; U4 provides the stop of the bar. U5 positions the pulse on the screen. U3 and U4 outputs drive U1A and U1B, a set and reset latch. This latch output is equal to the bar width.

The vertical sync triggers U6 and U7. U6 and U7 drive a set and reset latch U1C and U1D. U6 delay determines where the top of the pulse and bar signals start. The bottom of the pulse and bar signal is determined by U7. The output of U1D, pin 11, are NANDed together through U2A and U2C. The pulse and bar signals are mixed in R17. Output is obtained through R19. The horizontal sync signal is 4 μ s wide and is resistor mixed to make the horizontal sync tips. The same input drives U8, a 11- μ s-wide pulse for the horizontal sync front and back porch. It is also resistor mixed through R20.

Video switcher (A4 board). The switcher (fig. 3) works almost on the same principle as the pulse and bar generator. U1, U2, U3, and U4 perform the same job as U3, U4, U1, U6, and U7 in the pulse and bar generator. The outputs of U5, pins 6 and 11, are NANDed in U6A. U6A output drives U7B and U6B. U6B is an inverter that drives U7A. In other words,



Photos M and N: Pulse and bar generator output shown in one horizontal time period, left. At right, pulse and bar generator output shown in one vertical time period.

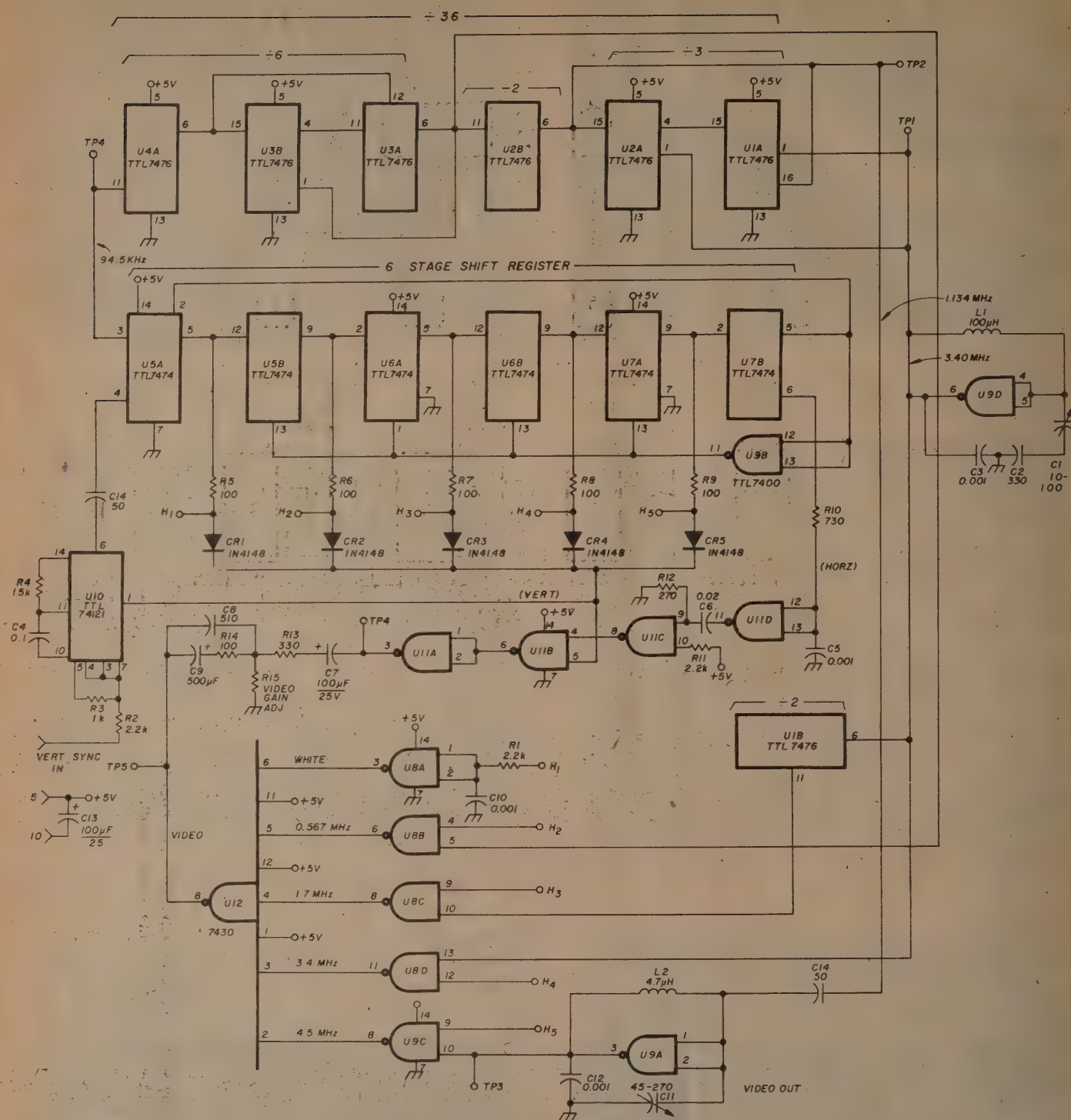


fig. 1. Multiburst generator schematic (A1 board).

only one section of U7 is on at any one time. Window-positioning pots R1-R4 control the vertical and horizontal start and stopping position of the switched video.

The video switcher, U7, is a CMOS IC. A low on pin 5 turns off the switcher between pins 3 and 4. If you put a high signal on pin 5 the switch turns on. Now it acts as if a 300-ohm resistor were placed be-

tween pins 3 and 4. (This CMOS IC is a CD 4016, but a CD 4066 can be used.) Switcher U7 outputs are tied together and run into a 74C04 inverter used in linear mode. The output of U7 is positive video to be amplified, so it was necessary to run it through two inverters. The output of a CMOS IC doesn't like a 100-ohm load, so it's buffered with an emitter follower, Q1.

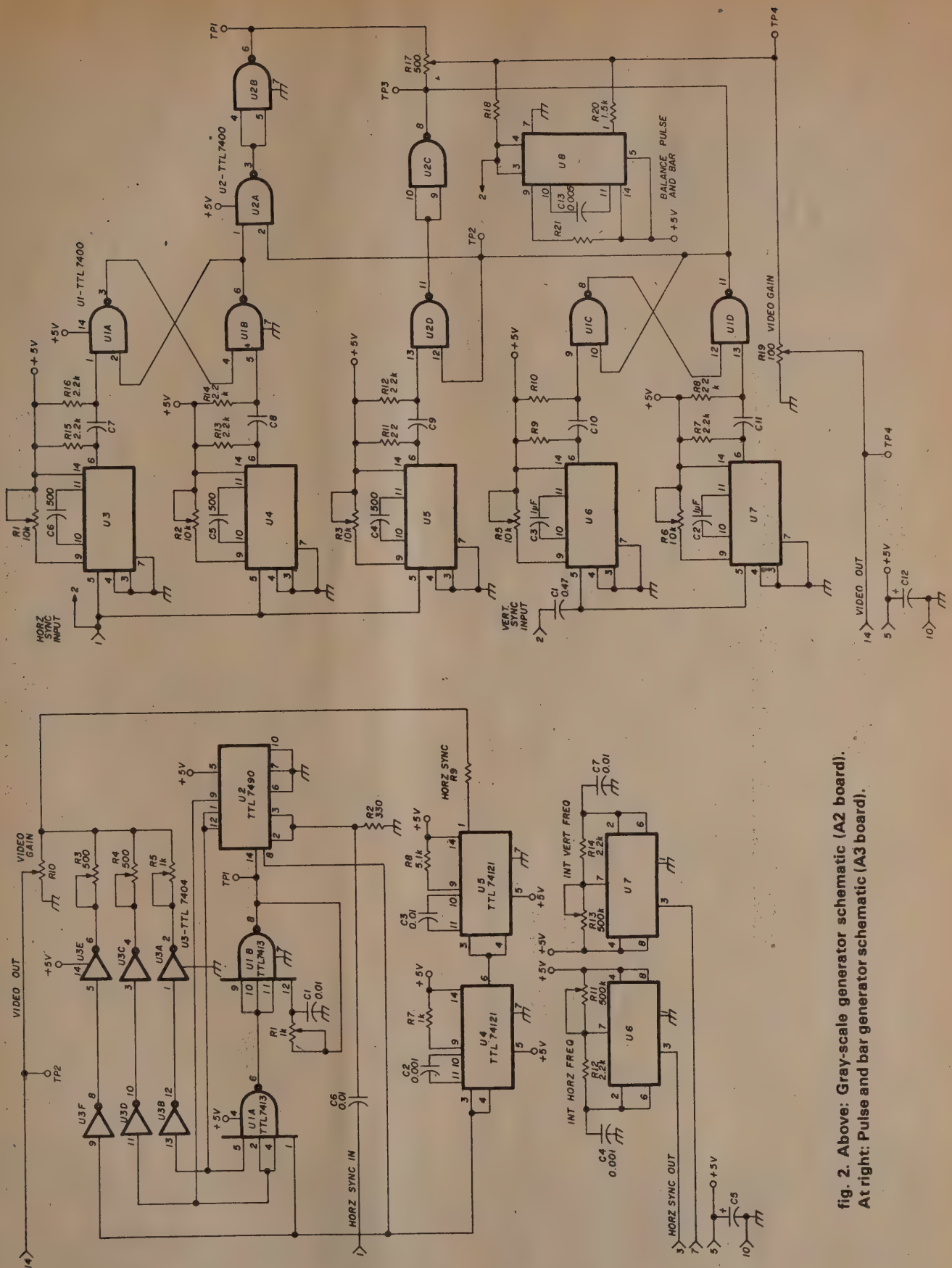


fig. 2. Above: Gray-scale generator schematic (A2 board).
At right: Pulse and bar generator schematic (A3 board).

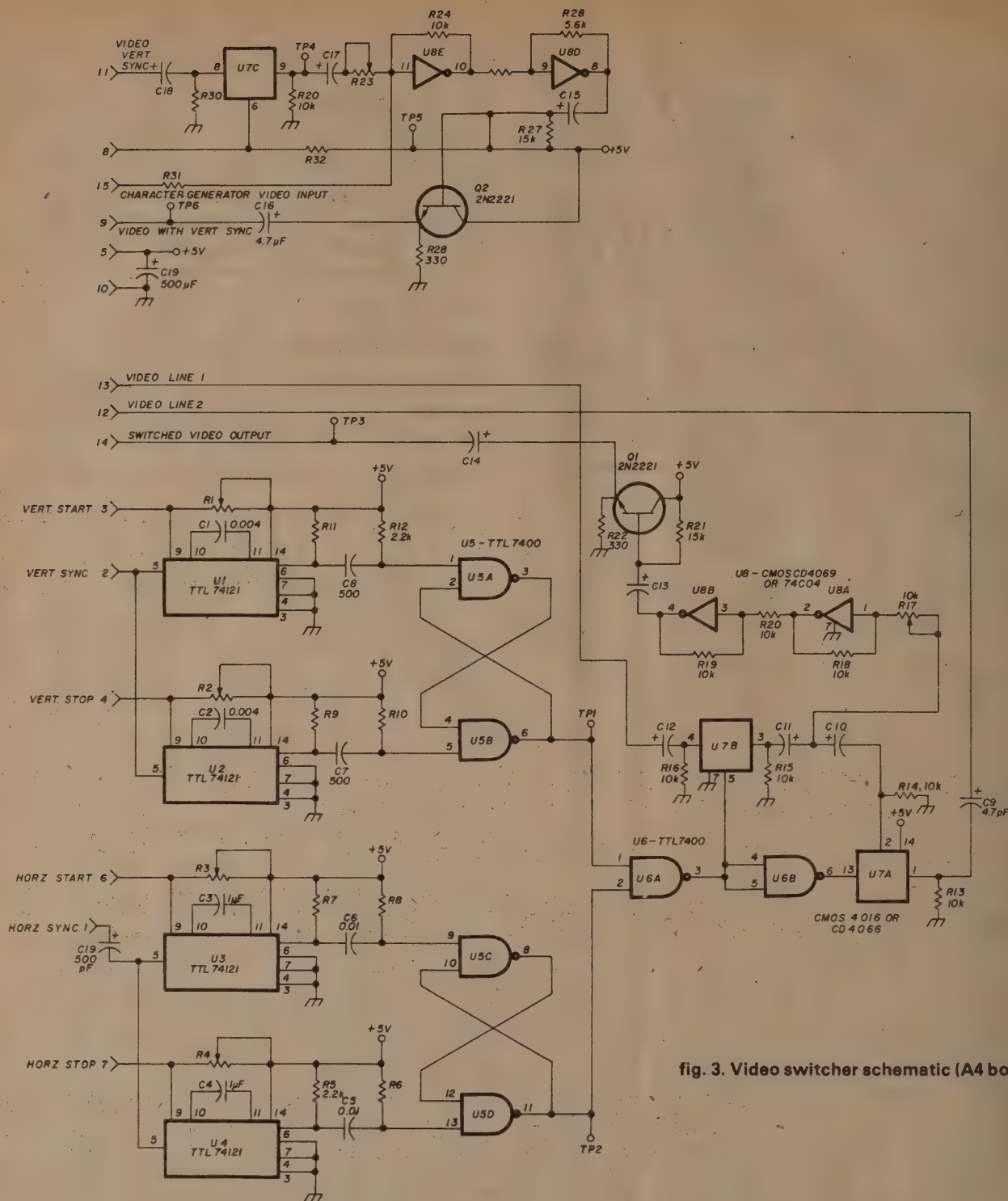


fig. 3. Video switcher schematic (A4 board).

The vertical sync blanker and dc restorer circuit are on the video switcher board. U7C is a switch controlled by the vertical sync pulse. Any video coming in at A4 pin 11 will be blanked during the vertical sync interval. After this, the video is reamplified through U8 and is applied to emitter follower Q2. At the base of Q2, the vertical sync pulse is reinserted to take the

vertical base line down to the correct reference. The character generator video input is inserted at U8 pin 11, through R31.

Gen-Lock (A5 board). The video input enters on A5 pin 1 (see fig. 4). It drives Q1, a sync stripper. Q1 removes all the video, and only composite horizontal and vertical sync signals remain at the Q1 collector.

The sync signals are run through RC filter R4, C3, C4, R5. The vertical sync drives Q2, an amplifier, whose output is applied to the sync selector on the front panel.

The horizontal sync is applied to U1, a phase-locked loop. The IC is a PLL567, which is tuned for 15,750 kHz. This IC is a tone decoder. When it's locked onto an incoming signal, it has a dc output at pin 8. There's also a signal at U1 pin 5. This signal has the same frequency as the incoming signal during lock. U1 pin 5 output is then used as the horizontal sync in the generator and goes to the sync selector switch.

The sync-selector switch output is fed to amplifier Q3 for vertical; Q5 for horizontal. U2 is a Schmitt trigger for fast trigger timing. Q4 is a buffer for the vertical sync. Q4 output drives all the vertical and/or horizontal inputs of boards A1-A5.

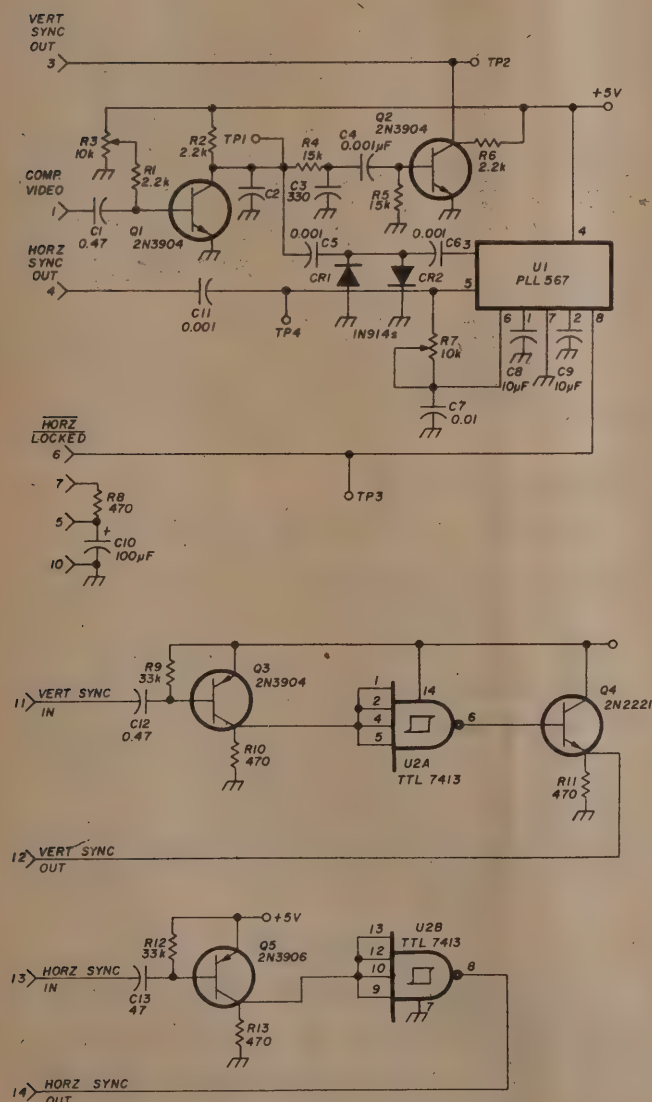


fig. 4. Gen-Lock schematic (A5 board).

interconnections

Fig. 5, the main board, shows how to tie it all together. A shows sync-selector switch connections. B shows how to interconnect the rotary function-generator switches to the five PC boards. C shows the interface between the window-position controls and video switcher/Gen-Lock boards.

adjustments

Multiburst generator (A1 board).

1. Adjust C1 for an output frequency of 3.402 MHz at U9 pin 6 or for horizontal locked sync on TV when video is fed into the TV.
2. Adjust C11 for an output of 4.5 MHz on U9 pin 3.
3. Adjust R15 for video gain. It should be 1-volt p-p at A1', pin 14.

Gray-scale generator (A2 board).

1. Adjust R1 for 126 kHz at test point 1, or for seven shades of gray on the TV screen.
2. Adjust R10 video gain for 1 volt p-p video at test point 2.
3. Adjust R11 for 15,750 kHz at U6 pin 3.
4. Adjust R13 for 60 Hz at U7 pin 3.
5. Adjust R3 for approximately 75 ohms.
6. Adjust R4 for approximately 250 ohms.
7. Adjust R5 for approximately 600 ohms.
8. Adjust R3 = R5 for the best linearity of output video.

Pulse and bar generator (A3 board).

1. Adjust R1 for vertical position of left side of bar on TV screen.
2. Adjust R2 for vertical position of right side of bar on TV screen.
3. Adjust R3 for vertical position of pulse (see photo L).
4. Adjust R5 for horizontal position of top part of pulse and bar.
5. Adjust R6 for horizontal position of top part of pulse and bar.

Video switcher (A4 board).

1. Adjust R23 for 1.5 volts p-p video at output of test point 6 when you have 1 volt at input.
2. Adjust R17 for 1 volt at test point 3. R1-R4 are front-panel controls but could be preset pots on board.

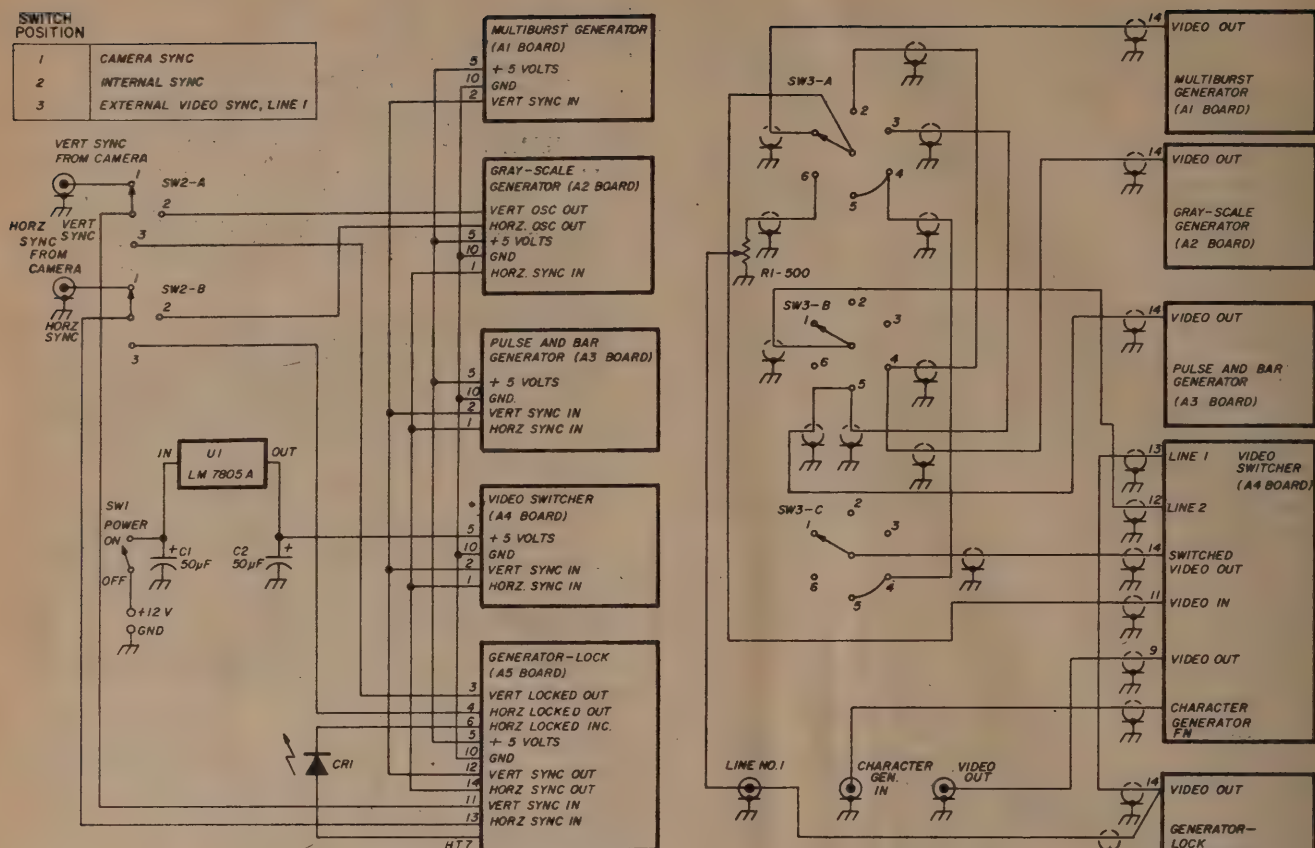
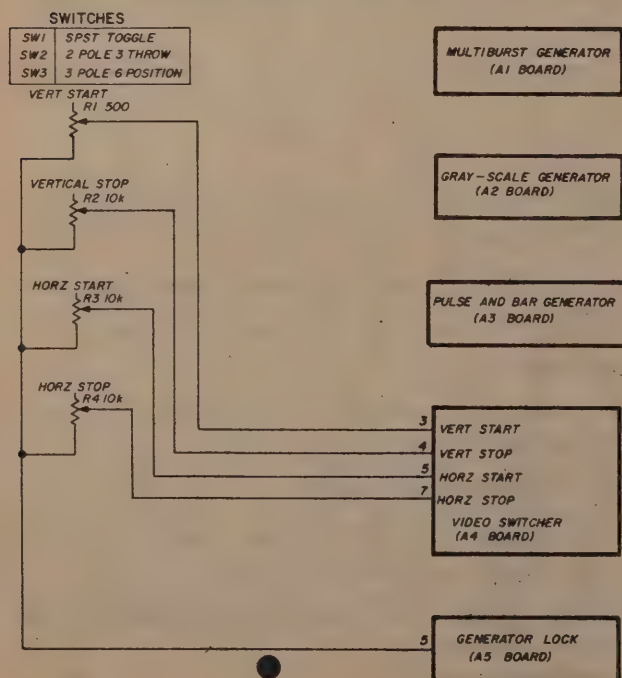


fig. 5. Circuit-board interconnections. (A) shows switching between horizontal and vertical sync signals from camera and the five PC boards. Function-generator switch logic is shown in (B). Interface between window-position controls and video switcher-Gen-Lock inputs is shown in (C)



SWITCH POSITION	
1	MULTIBURST GENERATOR
2	GRAYSCALE GENERATOR
3	PULSE AND BAR GENERATOR
4	GRAYSCALE + LINE 1 VIDEO SWITCH
5	PULSE AND BAR AND LINE 1 VIDEO SWITCH
6	CHARACTER GENERATOR + LINE 1 VIDEO

Gen-Lock (A5 board).

1. Adjust R3 for clipping of video at test point 1.
2. Adjust R7 for 15,750 kHz at test point 4 with no video input at A5 pin 1.

This video console was constructed on five PC boards, one for each generator. It was done this way for ease of construction and system checkout. You can use any one of the generators or switches by itself. Just insert the vertical and horizontal sync signals and the + 5 volts to the board you want to use. I've had very good results with this console and a lot of fun in its construction and use.

references

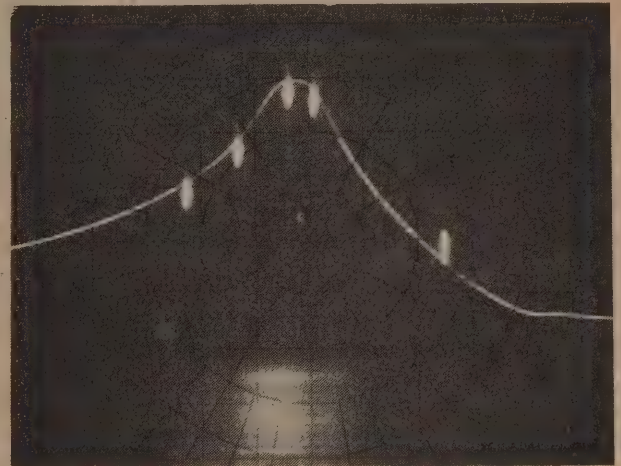
1. W. E. Parker, W8DMR, "A Multiburst Generator," A5 magazine, September-October, 1973.
2. Al Lipkin, K3AEH, "Let's Build A Staircase To The Bars," A5 magazine, May-June, 1977.
3. Gerald A. Eastman, *Television Systems Measurements*, Tektronix, Inc., September, 1969.

BANDPASS FILTER FOR ATV

DON'T THROW AWAY THAT OLD T-44 UNIT

BY WA3IUH

This article started when I heard that a local repeater association was having trouble with their ATV repeater. The Philadelphia Area Repeater Association, (PARA), is putting on a repeater at 439.25 Mhz. in, 421.25 Mhz. out. The receiver is at 800 feet and the transmitter is at 600 feet on TV Ch. 29 tower located just outside Philadelphia. The antennas are fed with 7/8" hardline to 9 db antennas and are vertically polarized. The only problem keeping it from full repeat capability is that there must be at least 100 transmitters in a quarter mile radius transmitting from DC to light frequencies. Every time the repeater would go into repeat position -- you could see signals getting into the repeater & keying it up. Unfortunately, only a couple of ATV signals could get into the repeater. The obvious answer was use of a "bandpass filter". I started to look around and tried a couple of different ideas. The result was that they were either too expensive or needed a machine shop to build. One night, I was looking through some old radio parts I had from my Motorola T44. In the pile was "Z5", which in the transmitting conversion article recommends removing. I wondered if it could be used as a band pass filter. I took it to work and looked at it with a H.P. 8505 network analyzer. Much to my surprise it looks pretty good. As you will see, it won't cure all problems, but considering the size and price it looks very good. (Photo 1.) (10 db Ver. Div.) I tried to tune it lower in frequency, but it looks like it does not like to work lower in frequency. Also, I recommend that the coax and semi-rigid be removed and connectors be soldered directly to the case, insertion loss was reduced by doing this. I later found out that a commercial filter was on order for the repeater and they were hoping to have the repeater back on the air very soon. So, if you're having trouble with interference on 439.25 Mhz., perhaps this may help you out? -WA3IUH Sam Cox, 76 Dewsbury Lane, Quakertown, PA. 18951



Markers - left to right	Mhz.	db from Reference
1	400	19.5
2	420	11.8
3	440	1.0
4	450	2.5
5	500	34.5

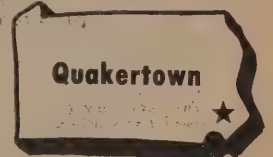


Photo 2. 10 db Ver. Div.
0-1300 Mhz. Horiz.

Markers - L-R	Mhz.	db from ref.
1	150	43.6
2	300	33.8
3	440	1.0
4	500	33.0
5	600	45.9

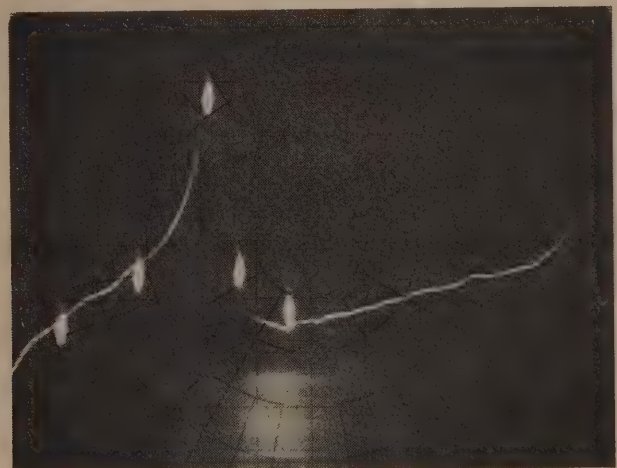


Photo 2. 10 db Ver. Div. 0-1300 Horiz.

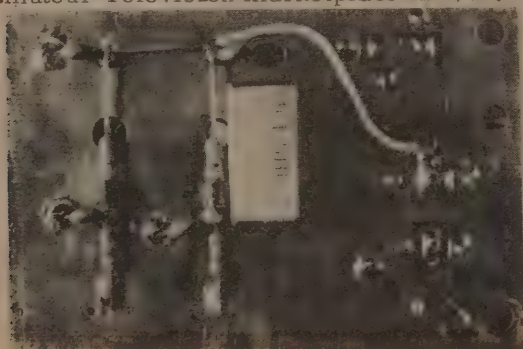


SE

DC-1 TUNER

Amateur Television Receiving Converter

It is very refreshing to see in "kit" form, an Amateur Television receiving down-converter that is specifically designed not only to work up to specifications, but to be easily put together by the new or old ATV operator. After unpacking the DC-1 UHF Converter, one readily sees a well constructed double sided PC board, quality component parts, and a very well written and printed instruction manual. The "kit" consists of 13 resistors, 27 capacitors, 3 coils, 3 transistors, 1 voltage regulator, 2 diodes, a double balanced mixer, 4 ferrite beads and the printed circuit board. Careful step-by-step assembly instructions aid the builder in putting the downconverter together. The "kit" builder saves \$15.00 over the assembled version that is available and can house the new circuit in a cabinet of choice with optional 110VAC built-in supply or terminal taps for 11-14 VDC operation. SPECIFICATIONS: 420-450 Mhz. (mine tunes a 40 Mhz. spread) 400 Mhz. thru UHF TV Channel 20. RF Stages: 2 (MRF 901 input, 1070 f6X 2nd stage) Noise figure: 1.7 db @ 450 Mhz (901) Local Oscillator: 2N5179 Grounded Metal Can UHF tran. Frequency Control: DC Voltage is tuned with Varicap Diode Mixer: Double balanced Output frequency: TV Channel 2-4 (adjustable) Overall gain: Approx. 20 db (rf gain minus mixer loss) Input Voltage requirement: 11-14 VDC at 50 ma. maximum draw PC Board: Double-sided stripline design Size of board: 2" x 3". The actual tuning up of the unit is not very hard. Hopefully, you will have a nearby ATV signal to align on, but if you are out in the boonies like me with so-so activity, a UHF TV channel signal (14-20) will suffice. With DC voltage applied to the input of the board, you simply check for correct voltages at several recommended points (resistors, transistors). C18 is first adjusted with an insulated alignment tool peaking on the received signal source. A side beaming attenuation of the signal might be in order for weak signal alignment. Further peaking back and forth of C1 and C8 will bring the signal in line. My main ATV station in Hiawatha, Iowa (41 miles away) was an excellent source to align on. The tuned picture looks great and the tuning pot used gives a nice smooth in and out swing of the video signal. The supplied 17 page instruction manual gives great pictorial parts layout diagrams with actual photo final finished assembled board and how it should look! (I must confess, the soldering on my board built doesn't look as nice as the one in the picture, I wonder why?) There is getting to be some representation of Mike Silvernail's products up here in the midwest with all excellent results. Silvernail products have been around for a long time distributed by Science Workshop and may be more familiar under that name. Mike has helped the local ATV group in Florida with an ATV Repeater and will become more and more visible to the Amateur Television marketplace in 1982. The DC-1 Downconverter rates A-OK by A5 Magazine!



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FEATURES:



- VARACTOR FREQUENCY TUNED FOR ALL OF THE 420-450MHZ BAND.
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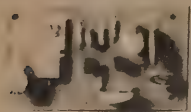
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ATV KITS AND MODULES



VM-2 VIDEO MODULATOR — Wideband collector video modulator for solid state exciters such as those from GLB and Hamtronics. Input for 4.5MHZ audio sub-carrier. 2 1/2" x 1 1/2"; **\$13.95 kit, \$18.95 assembled.**



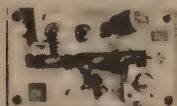
A-2 4.5MHZ AUDIO SUB-CARRIER — Accepts audio from VCR or GLB audio processor to provide ATV audio on TV set. Has on-board voltage regulator and shielded inductor. 2 3/4" x 1"; **\$18.95 kit, \$24.95 assembled.**



SA-1 VIDEO SYNC AMP — Provides separate video sync gain control for VM-2 above or SE-1a transceiver. Useful when driving solid state amps. 1 3/4" x 1 1/4"; **\$14.95 assembled, \$11.95 kit.**



TVM-1 TELEVISION MODULATOR — Adapts standard TV set so it will accept both video and audio. Uses LM1889 IC. 2 5/8" x 2 5/8"; **\$22.95 kit, \$32.95 assembled.**



P-1 WIDEBAND LOW NOISE UHF PREAMP — Uses MRF901 transistor to provide 16db gain and 1.7db noise figure. Covers 420—450MHZ band. Other frequencies received with change in input inductor. 2 1/4" x 1 3/8"; **\$17.95 kit, \$26.95 assembled.**



LA-1 UHF AMPLIFIER — Uses 15 watt MRF641 transistor with 7.8db gain @ 470MHZ. Stripline inductors with on-board pin diode antenna switching for a receiver. Designed for wideband color video with exciters such as the GLB T450L that provides up to 3 watts drive. Drilled and tapped heatsink included (4 1/2" x 1 3/4"). 1 to 3 watts drive typically gives 6 to 18 watts output. 12 — 14vdc operation @ 4 amps max. Double-sided board is 4 1/2" x 2". **\$69.95 assembled with test data.**

LA-45 UHF AMPLIFIER — Uses MRF646. Input power of 6-15 watts typ. gives 20-50 watts output. Biased for linear operation. Kit includes all parts, instructions and 4.2" x 3" double-sided stripline board. Needs 12-14 vdc @ 9 amps max. **\$59.95 kit.**



GLB T450L TRANSMITTER — 4 1/2" x 2" RF board typically supplies 2—3 watts FM output, 1 — 1 1/2 watts average video RF output. Changes for wideband video modulation provided. Comes with crystal for 439.25MHZ, with other frequencies available upon request. Also includes separate 1" x 4" audio processor board which supplies audio for FM modulation or for the A-2 4.5MHZ audio kit above. 12—14vdc @ 2 amps max. **\$54.95 kit, \$74.95 assembled and tuned.**

COMMON TO ALL KITS AND MODULES — 12 to 14 vdc operation. Drilled and plated glass circuit boards. Quality components with instructions including schematic and board layout.

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- ★ RUGGED 145 W DISSIPATION PA TRANSISTOR
- ★ ULTRA LOW-NOISE RECEIVE PREAMPLIFIER
- ★ EQUIPPED WITH RF VOX AND MANUAL OVERRIDE
- ★ L.E.D. STATUS LIGHTS FOR POWER AND TRANSMIT
- ★ SUPPLIED WITH POWER LEAD AND ALL CONNECTORS

SPECIFICATION

LINEAR AMPLIFIER

Power profile	: 50 watts typical output for 10 watts input
Power gain	: 6 dB minimum
Frequency bandwidth	: 430-440 MHz at —1 dB
Power requirements	: 12.5 volts at 8 amps for 50 watts output 13.8 V maximum
Quiescent current	: 1 Amp nominal at 12.5 volts (with zero drive)

RECEIVE PREAMP

Overall gain	: 10 dB typical
Overall noise figure	: Better than 3.0 dB
Frequency bandwidth	: 430-440 MHz at —1 dB
Receive current	: 75 mA nominal at 12.5 volts

GENERAL

RF input connector	: 50 ohm BNC	Weight	: 2 kg. (4lb. 6oz.)
RF output connector	: 50 ohm BNC	Overall size	: 265 x 117 x 54 mm (10 ⁷ / ₁₆ x 4 ⁵ / ₁₆ x 2 ¹ / ₈ ")

DESCRIPTION

- This 432 MHz solid state linear power amplifier, MML432/50, is intended for use with any existing 432 MHz equipment having an output power of 10 watts. When used in conjunction with such a drive source, this linear amplifier will provide a power output of 50 watts, and the incorporation of a low-noise receive preamplifier will provide an improved overall system noise figure.

The inclusion of the latest state of the art power transistor (rated at 145W dissipation) guarantees highly reliable and ultra-linear performance, which makes the unit ideal for all modes of operation, (SSB, FM, AM, CW and SSTV). The amplifier utilises recently developed matching techniques which allow safe operation even when improperly subjected simultaneously to 50% overdrive and a supply voltage of 15V. The PA transistor is thermally tracked against ambient temperature variation and operational temperature rise.

By means of an internal RF vox circuit the linear will automatically switch onto transmit when 432 MHz drive is applied to the input socket. However, this facility may be overridden by the application of an earth to pin 1 of the 5 pin DIN socket located on the rear panel. This may be achieved by connection to the transceiver PTT switching line.

Protection is included against reverse polarity.

All RF circuitry is constructed on high quality double sided glass-fibre PC board and the use of broadband stripline techniques gives the unit a bandwidth of 430-440 MHz, without the need to retune.

The unit is housed in a highly durable, extruded aluminium enclosure RF input and output sockets are located on the rear panel, together with the push to talk line phono socket.

The unit is supplied fitted with a 12V supply cable, plugs for both input and output connectors and a phono plug for the PTT line.

MICROWAVE MODULES
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Telephone: 051-523 4011 Telex 628608 MICRO G

Also available from: Spectrum International and/or PC Electronics (W6ORG)

THREAT TO ATV FREQUENCIES PROPOSED

SCRRBA Exposes Quiet Request to FCC

W6ORG Tom O'hara reports that the "Del Norte Technology, Inc." is attempting to get FCC approval for use of their line of 435 Mhz. radio-positioning equipment (ship to shore or fixed point) as a secondary frequency use in the Amateur 430-440 Mhz. segment of the UHF band. The "Trisponder UHF" system utilizes "spread spectrum techniques" via "chirping" and operates at a claimed much farther distance than usual line-of-sight coverage. The wide-band signal increases and decreases frequency during transmissions, outputting energy over 10 Mhz. spread. The 50 watt unit claims plus/minus 2 meters to line of sight, plus/minus 4/-2 meters to 75 km. non line of sight. Accuracy can vary beyond 75 km due to uncertainties caused by tropospheric scattering in the upper atmosphere. (Skip). Tom says this type of signal will "wipe out ATV" with no problem, and supplied the ARRL with ATV gear for tests with not so much as a thank you for long awaited results. The East and West coasts including the southern coastal areas will be most affected. Think you midwesterners are safe from QRM? Don't bet on it. "Del Norte" sees all kinds of possibilities if approved such as for crop dusting accuracy, etc. SCRRBA is fighting this with a recently sent 31 page response to the NPRM and hope FCC officials will take heed and consider the Amateur viewpoints. A5 Magazine will continue to keep a watch on this proposal and will report results. We are looking into this potential nightmare to check into the best stand to take & just what we can do to represent over 1600 ATV'ers in this matter. Let us hear from you the membership. Thanks Tom for the information. Keep up the pressure SCRRBA!

QUICK PARABOLIC ANTENNA CURVATURE TEST

by Paul F. Magee W3AED

To make a quick compound curve test of your parabolic antenna for surface accuracy, you can do the following. First, install three to four rods, pipes, etc., to support your pickup device at the focal point, extending it some distance beyond the focal point, with adjustable threaded rod back to the focal point. Install a temporary piece of white cardboard at the focal point about 6" in diameter. (You might have to guess at this point if your focal point is still unknown.) Second, point the parabolic into the sun by adjusting the EL and AZ so that the shadow of the sun from the cardboard piece shades a spot in the dead center point of the cardboard. (It will center for only a short time with the movement of the sun.) Third, take a back surface mirror about 1 or 2 inches in diameter and slide it over the parabolic surface at numerous spots from center to rim, top to bottom and left to right. If the reflection hits your board (dead center) you can assume to have a perfect parabolic. If the sun's reflection varies over a wide area, the incoming signal is certainly going to miss your "waveguide entrance". The mirror must be held flat against the parabolic at all times. Always use a mirror that will lay flat against the surface of the parabolic antenna. For 1296 Mhz. with a wire mesh backing about a half-wavelength long, a mirror of 4.5 inches might be desirable. For 440 Mhz. a much larger mirror will have to be used. I hope this may be of help to some of you with parabolic antennas. Good Luck! -Paul F. Magee W3AED Rural Route #2, Box 432, Berlin, Maryland 21811

NEW A5 MAGAZINE FOREIGN MAILING POLICY CHANGE

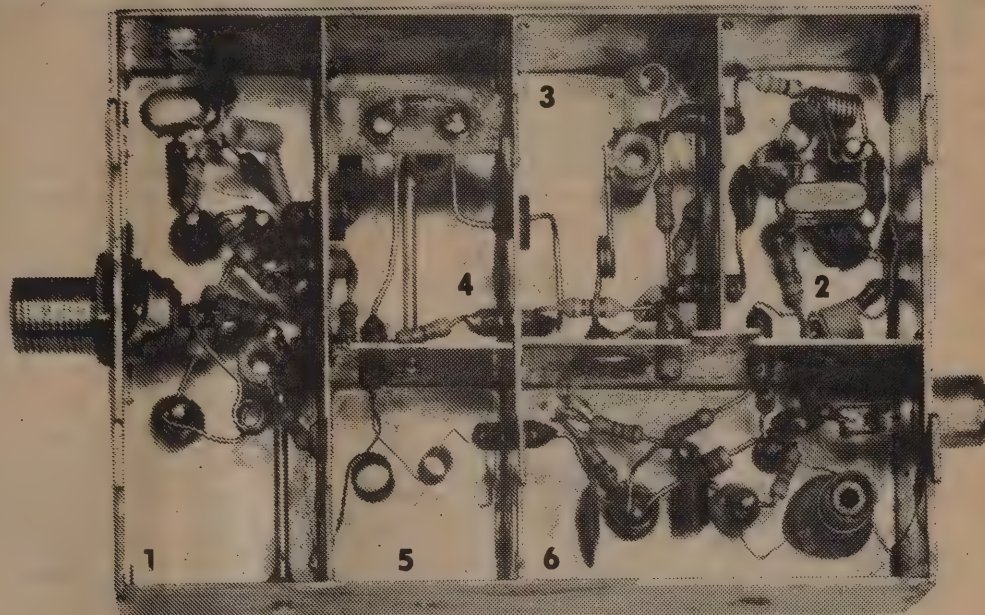
Surface versus Air-Mail Rates

Effective with the Nov/Dec 1981 issue, changes were implemented in the mail handling procedures for A5 ATV Magazine. Changes were made to insure the periodicals future success. It was discovered that foreign mailings were a total loss with present revenues collected. Examples are any European subscriptions previously costs \$10.00 per year. Postage (air-mail) in the fall of 1981 was \$2.08 per issue (3-4 oz.) totaling \$12.48. The cost of the brown envelopes, labels, mail handling service charges let alone the cost to print the magazine. It was estimated that this type of subscription cost A5 Magazine around \$17.68 (no needed profit figured). Canada and Mexico--have been all indexed at automatic air-mail rates for speedy delivery to our friends north & south. The decision had to be made to simply make all foreign subscriptions at air-mail rates or give the choice between the slower SURFACE rates and the faster AIR MAIL rates. The latter decision was made giving foreign subscribers a financial choice in the matter. Those current subscriptions in all other foreign countries except Canada have been filed SURFACE unless extra monies is received to upgrade to the AIR MAIL rates. To upgrade into the faster service, forward \$13.00 per year above the sent \$10.00 sub price. Canadians send \$5.00 extra (checks please no money orders) for new AIR MAIL rates. Thank you! -WB0QCD

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- 5. V.H.F. (I.F.) FILTER.**
- 6. V.H.F. (I.F.) POST AMPLIFIER STAGE. (Q₄)**

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UHF-900 MHZ RCA SOLID-STATE BASE STATION. UHF-FM rack mounted units (Receiver, Xmtr & Pwr. Supply). Designed for operation in the 952-960 MHZ band (probably retunable to the new 900 MHZ. ham band). Continuous duty 5 watts (nominal) output. Receiver has 72 MHZ & 10.7 MHZ IF's with 8 pole CRYSTAL FILTER. **OUR PRICE.** \$1300 complete, or \$500 ea. (XMTR. REC. OR PWR SUPPLY), **OR BEST OFFER.**

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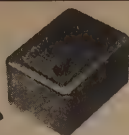
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Receiver Gain 30 dB typ.
Prime Power 12V DC



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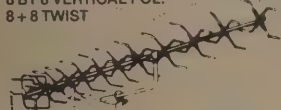
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"PREVIEWS" OF A5 MAGAZINE UPCOMING ARTICLES IN FUTURE ISSUES

Flexible ATV Setup, Rose Parade 'TV' Coverage, Operation Santa Claus 1981, Weather Public Service ATV, Portable Camera Power supply, SEla ATV Rig 'review', ATV Antenna comparisons, VCR and ATV, 439 Mhz, 75 Ohm-50 Ohm Tuning circuit, New York, Chicago, Minnesota ATV, ATV Repeater directory, Weather Satellites, FAX Revisted, SSTV and Oscar 8, UOSAT Update, Earth - Stations a few years later, CATV Update, New German SC-422A Review, SSTV and Computers, Hard copy SSTV Printer for your TRS-80C, Color SSTV Advances, Animated SSTV Invented, TVRO Part 2, RTTY with K0WVN, Video RTTY Communications, How to build a VHF RTTY Repeater, And More!!

44 YEARS DEVOTION TO AMATEUR RADIO

A5 MAGAZINE'S TRIBUTE TO

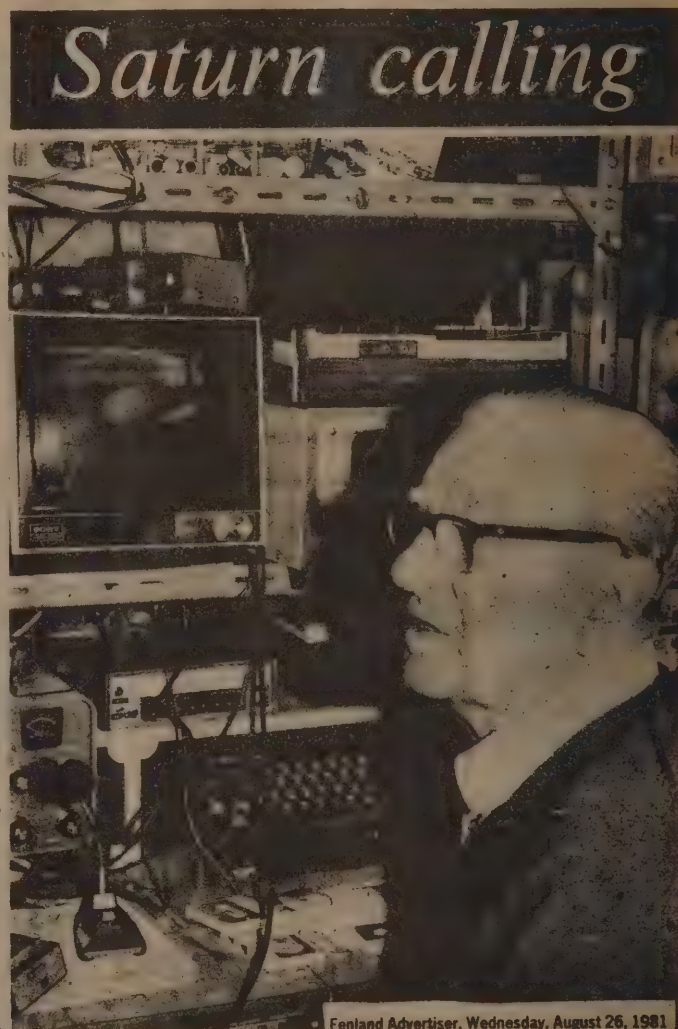
G3WW RICHARD THURLOW

The term "Ole-Man" is used quite often in Amateur Radio, and the term can never be more suitable in SSTV circles when applied to G3WW (Whiskey Whiskey) Richard Thurlow of Wimblington, England. Born June 28th, 1905, Richard received his first experimental-receiving license in December 1920. His determination and curiosity led him to his own "transmitting license" on November 11, 1938. While running the various modes of CW, AM and SSB in "Ham Radio", Richard became interested in a new-fangled mode called Slow-Scan Television in November 1972. The rest was history as G3WW SSTV Video became a common view on P-7 tubes thru today on the digitized monitors. Richard's equipment consists of the Robot 61/70A and 80A system, Robot 400 Converter plus 2-W9NTP memory boards for 3 memories, a Sony 10 inch B/W TV set, Ferguson 14 inch Color TV set wired to input into the color gun video stages from the Robot 400 memories for COLOR-SSTV! Additional equipment includes a WB9LVI converter for SSTV which was the first known in Europe built by G3GGJ Howard Waton, W0LMD Keyboard, SSTV active filter network built in Scotland and if that doesn't rid the QRM an Autek QF-1A filter is brought into line. The home in which Richard resides is also of vintage as it was constructed in 1590 and stands in 1 1/2 acres only 16 feet above sea-level. G3WW is also a call recognized in phone-DX circles presently at 317 countries with an additional 105 countries confirmed (CQ Magazine DXCC-SSTV) on the SSTV mode! Just before the DX European band dropped on 10 meters last spring, Richard was nearing 2,000 contacts on SSTV (and he only counts "new" contacts!) His HF "station" consists of an Icom 720A, Heath SB401, Heath SB303 receiver and SB220 linear amplifier. All this RF is fed into a Hy-gain 205BA, Mosley 10/15 3 element and a 40/80 meter "Lazy-H" all at 58 feet above ground level. VHF operation consists of a dual 16 element yagis system (Tonnas) stacked vertically with a top measurement of 71 feet AGL. The transceiver is an all-mode Yaesu FT-221R with Lunar preamp into a NAG 144 XL linear with 4CX350 finals. Richard's most recent accomplishment was receiving the Voyager 2 SSTV pictures of Saturn and its' rings from W6VIO Jet Prop. Lab in Pasadena, California. The retired county council clerk (a highly esteemed position in England), can be found on both 14.230 and 28.680 Mhz. or wherever SSTV signals are being monitored. Many stateside Amateur operators have visited Richards "shack" during visits bringing back stories of wires and projects that never seem to tire the "Ole Man". Richard is in constant contact with G3NOX, 7WOD, and W6VLH transmitting and receiving the latest COLOR SSTV photographs. The elderly pioneer has certainly seen it all from the early days of P7 tubes to digitized color video, from early transmitters to today's state of the art equipment, from bulky hot tubes to quiet miniature transistors. Our "hat is off" to this bold, adventurous pioneer of Amateur "Ham" Radio as G3WW represents to all of us what Amateur Radio is all about; a fulfilled "hobby" with both learning and satisfying rewards.

Good Luck Richard from all of your "friends" all over the world wishing you a healthy next 44 years and awaiting that roughly call of G3Whiskey Whiskey.

G3WW
Richard Thurlow
#2 Church Street,
Wimblington, March,
Cambs, England

A5 Magazine awards Richard a 1 year subscription.



Fenland Advertiser, Wednesday, August 26, 1981

WORKS 3-BANDS TO WIN SSTV CONTEST



W2GND, Harry Harchar of Hightstown, New Jersey knows how to win SSTV Contests utilizing multiple bands! Harry totaled 101 points in the fall Sept. 1981 A5 Magazine WAS (Worked All States) Contest via SSTV. The bi-annual event is held the 1st weekend of September and the 2nd weekend in February. The purpose of the SSTV contest is to work as many different U.S. States on the A5 mode as possible during the contest period. Bonus points are awarded for "new" states and specialty contacts such as 256 line or Color SSTV. The hard to get states of Alaska and Hawaii has a bonus factor of 500 points in the revised February contest. Harry's expertise came in working several bands on SSTV to attain his points. He worked 80-40 and 20 Meters (didn't even work the hot ten meter band!). Some of his comments of the contest was that many did not know of the contest and that the band was not in the best shape for his area. (More publicity is being generated on upcoming contests with bigger prizes!) Our congratulations to W2GND, Harry Harchar of Hightstown, New Jersey-his subscription has been extended by one year and he now has a nice new "gold" certificate hanging on his wall for the A5 Magazine 1981 SSTV WAS-Contest!

HAVING FUN WITH SSTV BY JOHN GRAY W1REQ

John Gray, W1REQ writes A5 that he enjoys using SSTV with PAØDX in an international game of video Checkers on-the-air! There have been previous reports of "Tic-Tac-Toe" Championships from down South America way in Argentina, but this is the first we know of using actual checkerboards and figure cutouts! "The rules of Checkers can be found in any library or Encyclopedia Britannica" says John. "Cut out the figures and place on the board for each move sending a minimum of three frames SSTV per move. The figures with the crosses are kings and the figures are easy to distinguish between the players. Always play on the black squares, the black men are first and are placed at the top. The side designations can be used for placement verifications and incorporated in SSTV graphics. If there is enough interest, I would be glad to print a batch of these full size drawings up so many can play!" Send large SASE's to John L. Gray, W1REQ, 99 Oenoke Lane, New Canaan, Conn. 06840. Good Luck! Please include \$1.00 to cover the cost of the copies. Thank you!

MEET JOACHIM BREUCHA "DJ4GL"

Am Moosbuegl #9--8432 Beilngries,
West Germany



A5 Magazine Foreign Rep. DJ4GL

Joachim is A5 Magazine's German Foreign Representative in Europe. He is very active on 10 meter SSTV and enjoys DX'ing greatly. He is married with one son and two daughters. At age 40, he got his Amateur license in 1957 and became active in the A5 mode 1978. His boyhood studies of electronics fulfilled his eventual career as an electronic-engineer. Joachim helps A5 Magazine by devoting some time each month aiding new subscribers with information and sample issues. He also plans on taking some of the A5 Magazine articles and translating them into the German language for articles in CQ-DL Magazine (monthly periodical most popular in Germany. Joachim will handle subscription requests and inquiries, some sample issues and will be sending us articles of interest to US A5 readers! He is just one of 7 overseas correspondents performing this

volunteer function as "foreign representative" for A5 ATV Magazine. Others include G3YQC-England, ZS6BTD-South Africa, CE3AUL-Chile, S.A., ZL2FR-New Zealand, JAØBZC-Japan, VE3BWW and

***** Always send SASE's to Foreign Reps *****



SC422A

The NEW German made SC422A 3-memory COLOR SSTV Converter with "flashing animation" & up to 256 line mode resolution and 16 shade grey-levels & Color keyboard graphic generator will be in the U.S. soon! See our review in the next issue and our demonstration at DAYTON 1982!

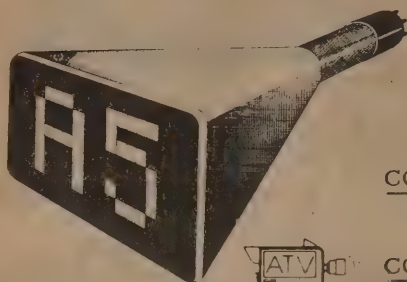


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contest news

Amateur Television Magazine



A5

**Amateur
Radio**

WAS SSTV

Contest

CONTEST DATES: SATURDAY FEBRUARY 13TH
SUNDAY, FEBRUARY 14TH



CONTEST HOURS: EST 9 AM SATURDAY TO 9 PM SUNDAY
CST 8 AM SATURDAY TO 8 PM SUNDAY
MST 7 AM SATURDAY TO 7 PM SUNDAY
PST 6 AM SATURDAY TO 6 PM SUNDAY

CONTEST FREQUENCIES: All authorized and recognized SSTV operating frequencies HF Bands.

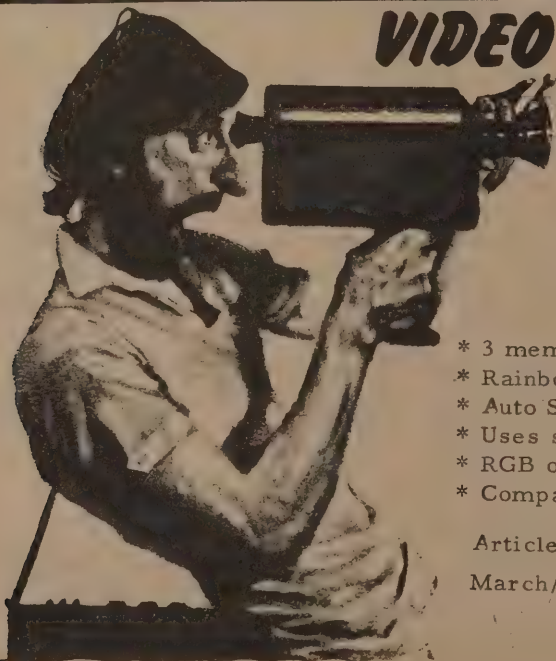
CONTEST DESCRIPTION A simple 36 hour SSTV Contest with operators attempting to work as many SSTV operators from other states as possible. The emphasis, as on previous A5 Magazine SSTV Contests, is additionally on "quality" not just quantity. 100 points for each new state listed, 25 points per contact with 10 "bonus" points awarded for live exchanges of "mugshots", Color two-way contacts, or 256 or 128 (1/2 speed) mode transmissions. Station calls and signal reports must be exchanged in VIDEO format by either camera, keyboard or light-pen generators. Alaska and Hawaii contacts count a bonus factor of 500 points!

CONTEST PRIZES: 1st place winner receives 3-year subscription (or renewal) to A5 Magazine, A framed Specialized Communication Certificate, photo published on front cover of A5 Magazine. 2nd and 3rd Place winners will receive 1-year subscription to A5 Magazine and certificate. All contestants will receive the gold-certificates with submitted logs.

CONTEST LOG ENTRIES: Submit actual or copies of contest log sheets by no later than March 1st, 1981 to Contest Manager, A5 Magazine, PO Box H, Lowden, Iowa 52255. Official results will be published in the May/June issue of A5 Magazine. Those winners attending the Dayton, Ohio Ham-vention will be awarded certificates at the regular ATV Forum meetings.

PLEASE PASS THE WORD TO ALL YOUR SSTV CONTACTS OF THIS CONTEST! GOOD LUCK!

VIDEO FLASH!



**COLORSCAN
By VE3EGO**

Shown at Dayton 81'

Available early 1982!



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IN A5 MAGAZINE!**

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- * RGB or Channel 2 NTSC video-output
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Article to follow in A5 MAGAZINE

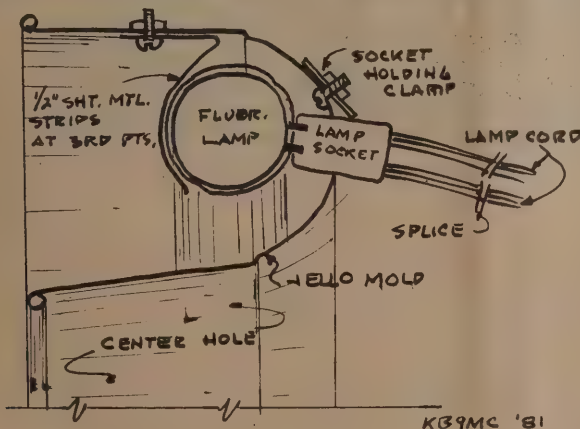
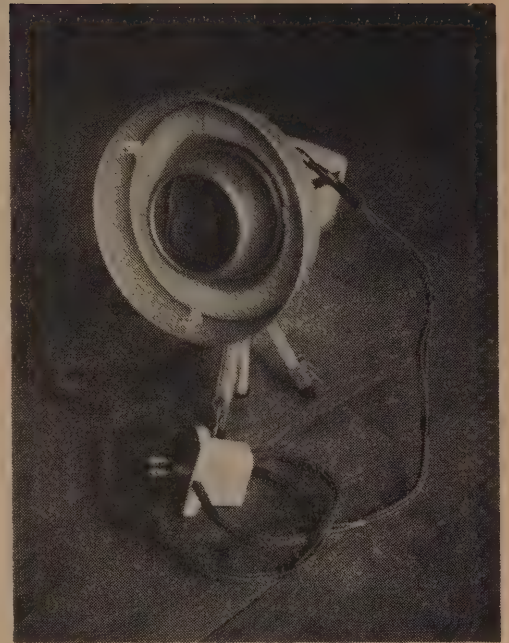
March/April issue!

Syd Horne VE3EGO
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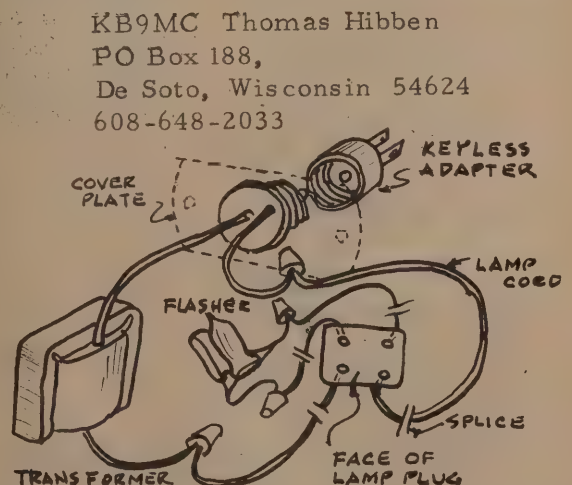
SSTV LIGHTING IN A JELLO-MOLD

BY KB9MC

Have you been struggling for good lighting for your SSTV Color or B/W subjects? Here's a recipe even your mother never -- thought of; Take one 9 inch X 6 1/2 inch cup aluminum Jello -- mold pans from the XYL's cupboard (Blame it on the kids, or claim burglary). Add one keyless adapter, two lengths of good quality lamp cord and a pinch of small metal clamp. The lamp must be the type made to replace incadescent bulbs in table or kitchen ceiling type fixtures. While shopping for the fixture, -- be sure to end up with the type where the transformer-ballast-housing comes apart. I used a "Littlewatt" by L&L Mfg. Eden Prairy, Mn. 55344. This has a short 4 conductor cord from -- the ballast with socket which accepts 4 prong plug of the standard circline lamp. Remove the cover plate with screw plug -- and disconnect wires at the wire nuts. Splice and solder four wires from 2 lengths of lamp cord to short wires of lamp socket and tape (see sketch). Other ends go to the housing connections. Solder and tape. Enlarge the notch in the side of hous- ing for the lamp cord and replace the cover plate. Screw on -- the keyless adapter. For the jello-mold, I used has a 9 inch diameter spun mold by "Mirro" model #M-0729-22. The capacity is rated at 6 1/2 cups. Drill a 3/8 inch hole through the rounded bottom (note sketch) and shape the hole to rectangular format with a small file or tin-snips for a tight-fit of the lamp plug unit. Small holes drilled on either side for clamp screws (6-32nd X 3/8)' will hold the lamp plug unit snugly. Using the sheet metal support tube from the fixture, cut and shape three pie- ces as per sketch and attach to the insides of the mold to hold the tube at 1/3rd points. The inside opening of the mold container tapers from 4 3/8 inches to 4 3/4 inches creating a perfect wedge-fit for my Panasonic WV1000A Video Camera. Other cameras may require some additional mounting brackets and container modifications. Circular lighting of incadescent light (found best for Color- SSTV work) with this apparatus allows the SSTV operator to photograph subject materal easier with less trouble between contrast and brightness controls on the converter. Another benefit of this mod- ification is the capability to do real good closeup work! When project is jelled, plug in and enjoy!



LAMP MOUNTING DETAIL



WIRING DETAIL

Next issue: Robot 400 Mod for superimposing Graphic overlays in memory with only the addition of a simple switch by KB9MC!

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AMATEUR RADIO AND THE TRS-80 COLOR COMPUTER

BY: CLAYTON W. ABRAMS

1758 Comstock Lane
San Jose, CA 95124

October 12, 1981

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PART ONE

During the last few months there has been a lot of talk about the new Radio Shack Color Computer on the SSTV Frequencies (14.230 and 28,680 Mhz). For those of you who are interested, here are some reasons you might consider the Color Computer for your ham radio applications.

My main interest in amateur radio is SSTV. In 1976 I decided to buy a computer system to replace my WOLMD keyboard. At that time, computer components were very expensive, difficult to obtain, and there was almost no software available. I finally selected a SWTPC computer system and within 2 years I had the computer receiving and transmitting SSTV pictures and graphics (ref 1). The project was very rewarding, however it had two drawbacks.

1. The system required a lot of technical background to duplicate.
2. The system required extensive, expensive hardware.

So I continued to look for a low cost system that was easy to use and readily available. I set some goals for the project. I would consider a system only if the following criteria could be met:

1. The hardware had to be available anywhere in the world.
2. The hardware cost had to be as low as possible.
3. The computer must have the capability of displaying SSTV pictures.
4. The interfacing had to be simple and easy to build.

I investigated several different systems like, the Apple, the Atari, and the Pet. The Apple had some of the necessary features, but its price was too high.

When Tandy announced their TRS Color with a list price of \$399, I knew my search had ended. After I obtained a 4K unit in late

1980, I spent the first few months reverse engineering it, and found it was the ideal Ham Radio System because:

1. Unlike other TRS models this unit did not have TVI or RFI.
2. The TRS-80C uses the most advanced 16 bit (internal) processor available, the MC6809.
3. The unit has a built in A to D and D to A converter.
4. SSTV can be displayed on the computer with no revisions.
5. The system is easily expandable.

RTTY and CW

To understand how this unit is used in an amateur environment, lets explore the most common application for a ham radio computer, RTTY & CW. In these applications the computer requires an interface which has some signal processing. The receive interfaces are mainly used to remove QRM. The transmit interface is used to provide the proper signals to the ham radio transmitter. On the computer all that is required is a single interface line which can turn off and on at a rapid rate. This line must be controlled by a computer program. In the TRS-80C the external hardware is connected by an interface called the RS-232. Figure 1 contains a schematic of the interface inside the TRS-80C which generates and receives these signals.

The RS-232 is just a notation which is a convenient way of expressing a signal with a predefined voltage level. The input RS-232 interface of the TRS-80C will also accept a normal TTL level. The input or output for this interface is actually a single bit of a parallel port. If you attach a computer interface for CW and RTTY, this single bit under program control can be programmed to receive and transmit in either mode. The transmit interface for CW is a relay attached to the keying circuit of the transmitter. The transmit interface for RTTY is an AFSK modulator attached to the microphone input. The receive interface for both RTTY and CW is a demodulator which provides a two state input into the computer for decode. One of the interesting features added to the RTTYCW program is the facility to exchange programs over ham radio. I have been exchanging programs over 2 meters locally with good results.

ANALOG INTERFACES

Probably the biggest asset of the TRS-80C is its ability to process analog signals. We live in an analog world. Digital electronics is foreign to most people. If an electronics device is

available which can convert an analog signal to digital, the computer can do something with it. The Color Computer has a built in digital to analog (D/A) converter, and an analog to digital (A/D) interface.

The D/A interface in the computer is used to record programs on the tape recorder and is normally attached to the microphone input. The A/D converter is normally used in the computer to read the location of the joysticks when games are played. With a little programming you can use these inputs for a purpose that Tandy never intended. To aid you in learning how these interfaces can be used, schematics are provided in figure 2.

SSTV GENERATION

You may wonder how these analog interfaces can be used for amateur radio? The answer is for amateur radio SSTV. Attached is the schematic of a simple SSTV modulator. With this modulator the color computer can be used to generate SSTV pictures and graphics. A schematic of this modulator is shown in figure 3.

In this mode the entire interface is controlled by software. You can generate pictures or graphics entirely by software. Unlike hardware, software can be changed quickly to create video at almost any rate up to the limits of the processor.

With this modulator the output from the D/A is used to develop the video. When the RS-232 line is dropped low, the interface outputs a sync frequency. When high the output of the SSTV modulator is controlled by the D/A. All that is required to generate a SSTV picture with this interface is a TRS-80C and a software package. The total parts cost is about \$15, depending on your junk box. Everything is available mail order from any number of firms.

SSTV RECEIVE

If you can transmit SSTV the next trick is to display a SSTV picture on the TV attached to the computer. A number of firms offer hardware package to do this, but they all have a high price tag. Since many people have limited budgets for ham radio the TRS-80C makes a good compromise. Additionally, unlike the high priced hardware units the computer can be used for other things. I don't have much room in my ham shack and prefer to have multi purpose equipment.

I was very surprised by the quality of picture that can be displayed on this computer. In some cases the picture is as good as or better than a Robot 400. In order to display pictures on the TRS-80 two built in electronics devices are used in the computer.

One device is called the MC6847 which is a Color Display Generator IC manufactured by Motorola. The second IC is the MC6883 which is called the Synchronous Address Multiplexer IC or the SAM. The SAM chip is used to control the memory addressing of the computer. Under program control you can change the type of video displayed, the memory addressing of where the video memory is located and other functions. The MC6847 is the actual device which displays the TV picture. This device is also very flexible and can be initialized to fourteen modes of video display. These modes range from alphanumeric characters to graphics. I elected to use the graphics mode for SSTV. In this mode displays from 64 pixels on 64 lines to 256 pixels on 256 lines can be displayed with up to eight colors.

Now that you are aware that a SSTV picture can be displayed, lets see how you can get a picture into the computer. To do this you must first have some means of converting SSTV to analog and digital signals. The device that is used in all SSTV receivers is a frequency to DC voltage converter. It converts all input frequencies from 1500 HZ to 2300Hz to a DC voltage from 0 to 5 volts. If a frequency of 1200 HZ is present this voltage is converted to a sync pulse. In order to obtain these signals you can tap off a piece of SSTV equipment or build your own front end.

If you have a SSTV receiver the interface is very simple. It will work nicely with a Robot 400, Robot 70 or MXV 100 SSTV receivers. The schematic of the Robot 400 interface is shown in figure 4.

If you have no SSTV equipment the interface can be constructed for about \$30. If you are interested, drop me a line with a SASE or IRC's if you are out of the USA and I will provide you with a copy of this schematic.

This interface works by software control. To start the operation the computer must first wait for a vertical sync pulse, by polling the RS-232 input by software. When the pulse is sensed, the program samples the A/D converter to which the SSTV video is attached. As each pixel is received the appropriate value is placed in memory. Once a picture is in computer memory the possibilities are almost endless. Under programming control you can modify, zoom, analyze, or print pictures from the computer. You are only limited by your imagination and your ability to program.

SSTV SOFTWARE, SSTV RECEIVE AND TRANSMIT PROGRAMS, COLOR SSTV RECEIVE AND COMPLETE SCHEMATICS WILL APPEAR IN THE CONTINUED ARTICLE IN THE NEXT ISSUE (MARCH/APRIL) ISSUE OF A5 MAGAZINE. FOR THOSE WHO CAN'T WAIT, WRITE TO CLAY ABRAMS, 1758 COMSTOCK LANE, SAN JOSE, CALIFORNIA 95124 OR SEND SASE TO A5 ATV MAGAZINE, PO BOX H, LOWDEN, IOWA 52255 0408.

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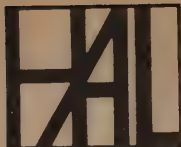


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R T T Y

HOW EASY TO GET STARTED?

By Joe A. Elliott, KØWVN

For those of you that have been thinking about RTTY and afraid to try, the following articles may, or may not, answer most of your questions. It is rather hard to get into a new mode without someone nearby helping you, especially hard for those out in remote areas with no one around in amateur radio except you. I will not bore you with charts of punched tape, pulse lengths, and etc.. These things, or this type of information, can be easily found in your RADIO AMATEUR'S HANDBOOK or the SPECIALIZED COMMUNICATIONS HANDBOOK. All this type of material means very little to a prospective RTTY'er and the first most asked question is, WILL MY EQUIPMENT WORK ON RTTY? The background, history and fine points, are things we can learn about later. Most don't care what it is made up of until they are off and running. So, I will keep this kind of duplication as brief as possible. I will not, if I can get out of it, name commercial name brands. By the time you get through reading these articles, I hope to have you wisely shopping around to get what suits your needs. I will not recommend you to purchase any particular brand, but rather give you hints on what to ask about when shopping for these items. There are a lot of little things left out of advertising that will be most important when you get to operating seriously. I have been through a lot of various stages with RTTY and will attempt to help smooth the process of JUST GETTING ON RTTY.

Since losing most of my hearing, due to a shooting accident on a police range, RTTY has really been about the only mode I work. I still get on two meters occasionally, but with my two hearing aids, some people are hard for me to understand. QRM will completely destroy my copying anyone on SSB and CW is too slow. Of course, there are several that can work CW very fast, but very few can do 60 W.P.M. with a hand key, certainly not I. Even if I could operate other modes comfortably, the RTTY mode would still be my most loved mode. Some of you will get hooked on this mode, others will just have it available to use at will.

I am sure you have seen how one will get on a mode, possibly a very smart fella with all the answers, and others will follow like lambs. RTTY is no exception, it is usually started by a fella in a group, let him get all the stumbling done, then others will ask his advice on getting started too. I am going to try and be this fella that will help you along. However, I will not claim to be the smartest fella on RTTY, nor do I have all the answers. If there is something I do not know about, I will do some researching until I do get the answer. This not only helps you, but helps me to help others as well. I will give you a bit of my RTTY history and then into the other nice things you should know.

About twenty years ago, while working with Western Electric, the telephone company was phasing out some old Teletype Corp. model 15 machines. At that time, an amateur would sign for such equipment (agreeing not to sell) and take it home. Of course, there has to be a rotten apple in every crowd, amateurs are not an exception and this practice was later dropped in this area. Anyway, I received

this machine in very good mechanical condition, very well taken care of. With no knowledge of anyone being on RTTY in this area, I got out my Radio Amateur's Handbook. In those days, RTTY was not popular and there just was not the selection of demodulators like we have on the market today. So, if you could not get a military surplus demodulator, the only other way to go was to build one. At that time, there was only one demodulator in the handbook, a design by W2PAT. After reading about RTTY for a bit, I decided to go down to a local radio supply and buy the parts. After assembly, I began my adventure in RTTY for the first time, and I will tell you the 'HEARTACHES' that can happen when not having help nearby.

First of all, you cannot use JUST ANY RADIO EQUIPMENT on RTTY. You have to be aware of what your equipment can take, RTTY is key down, much harder on equipment than SSB. So, the first thing to do is, check the manual, see if it mentions RTTY mode. If there is no mention of RTTY in the xmitter manual, then it might be wise to contact the maker of that gear and see if they have any suggestions. Also, most rigs you swear is 100 percent stable on SSB, will not be stable on RTTY! They will not show a stability problem until you have it key down for a period of time. In RTTY, you might find yourself in xmit for over ten minutes each xmission, maybe wanting to send a RTTY picture that could take an hour. If you think this is not aggravation, try copying a picture while the station is drifting, or just a plain QSO. So, some rigs will do better than others in stability, and some can be touched up to help a situation like this. When 850 hz shift was used some years back, filters were not as tight as they are now days with 170 hz shift. Some terminal units will lock up after 10 to 30 cycles offset, then you have to grab the dial and retune, if someone is drifting. Today, the name of the game in RTTY is 'STABILITY'.

Now, there are answers for some rigs, but not all of them. Today, most of the newer rigs come with comments in their manuals on how to use them for RTTY. But, those good old rigs that you hate to give up, may, or may not, survive the mode. The one thing I found to be the main problem in most of the rigs I had tried on RTTY was, HEATING AND COOLING of the VFO. That is, when you are in xmit, you are putting more heat in the cabinet. A VFO should remain a constant temperature, or most will drift. If you put a fan on the top of the cabinet, pushing air in, this will not help anything, other than cool the finals. Sure, we do want to cool the finals, but we do not want to push that heat over the VFO. I will give you an example of what I did on a KWM2 Collins transceiver, in trying to make it stable. I cut some poster board (stiff cardboard that is used in making posters) to fit around the final cage, then covered it with tinfoil. I installed it around the final cage so that it would fit tightly against the top of the cabinet. I then mounted a muffin fan directly behind the final cage, pulling out the air, not pushing it. This kept the VFO at a constant temperature and the finals cool. I then enjoyed drift free RTTY from that time on.

Of course, it makes a difference in what kind of finals your rig has. The rigs with 6146's most generally make good RTTY xmitters. Xmitters having sweep tubes do not make the best RTTY rigs, however, they can be run at low power. Sweep tubes cannot take the punishment that the heavier 6146's can, and they go soft quickly. There are some with solid state finals that say they can run RTTY, but follow the manual to the letter.

FIGURES	-	?	:	\$	3	!	&	#	8	'	()	.	,	9	0	1	4	Δ	5	7	;	2	/	6	"	<	>	≡	■	V	A
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FIVE LEVEL CODE CHART

If you have a transceiver, or looking at one, make sure it has a RIT, remote VFO, or offset tuning device. If you plan on using AFSK (audio frequency shift keyer), being tuned for 2125 hz mark and 2295 hz space, with the demodulator filters tuned for the same, you may have a problem without an offset tuning device. There is a natural offset when using LSB with AFSK and after calling a CQ, you will notice that the station answering you is off your receive mark frequency. If you move your main dial, you will only be moving down the band. So, you tune him with the offset tuning device, leaving the main dial as it was. When using rigs with FSK, this is not a problem, they are usually allowing for this when switched into the RTTY mode. For an example, the Kenwood TS-820 will not only do the offset, but will also put in a filter (if bought with the rig) and limit your power, when it is switched to RTTY mode. Since AFSK has been approved by FCC, there are very few RTTY'ers using FSK anymore. I don't know of any way to really tell the difference anymore, AFSK is very reliable with most rigs today.

I am not trying to discourage you from getting on RTTY, but merely trying to make you aware of what you might run into before you attempt this mode. I know of nothing more discouraging than to see your rig go up in smoke, or not perform as you hoped it would. Of course, I have not tried all the rigs available on the market, so there are going to be a few that will, or will not measure up to handling the mode. I presently use a Collins S-line for RTTY and a Drake TR-3/RV-3 for fone (if I only knew where I stored the mic). The Collins has been very reliable and runs full power out constantly without any problem. RTTY has a tendency to make a ham clean up his act, really having to re-do some of the things that he had been getting away with for so long. Good antenna systems, balun, low pass filter, good shielded wires, quality coax, just about anything bad with this type of equipment will eventually show up working this mode. Some of us got a bit on the lazy side and we did a lot of haywire things on fone. So, if you did it all up right the first time, you have it made. Not only will the rig perform better, but so will the operator as well.

When the fellas first get on RTTY, they are a bit nervous. Let me tell you, it helps to explain to a contact that you are just getting on and you will get all the help you would wish to have. Most experienced RTTY'ers are very helpful and will try to point out the important things that you should be doing. If it had not been for a fine fellow (Irv Hoff, W6FFC), I would have been waisting a lot of time fooling with various things, delaying my fun. If they point out equipment problems, DO NOT DELAY in correcting it, if you have gotten it confirmed by several contacts. Problems like splattering, clicks, reversed shift, too narrow or too wide shift, these problems will get you short QSO's and a lot of criticism if you continue to ignore them. Usually, most problems are very minor and can be corrected with very little time involved.

Here are some of the things you would like to know. LSB (lower sideband) is normally used on HF for RTTY, mark being 2125 hz and space being 2295 hz (170 hz shift), same tones are normally used on VHF and UHF. A good demodulator will usually be one that will detect two tones and not like PLL (phase lock loop) that detects only single tone. However, PLL is good for VHF or UHF where you would not be bothered by DRM or QSB. Commercial broadcast will use various shifts and speeds, not sought after like it used to be by hams. There is Oscar 9, using 1200 hz shift at 1200 baud. Army and

Airforce MARS still use 850 hz shift. Navy and Marine MARS are using 170 hz shift. Very little 850 hz shift being used today, except for a few die hard two meter nets. Due to the popularity of computers, wider shifts and faster speeds are being used on VHF and UHF. When 850 hz shift was popular, most rigs had to use lower tones to get within the band pass. Most will pass 170 hz shift tones with no ill effects at all. On HF, most of the communications is at a rate of 60 W.P.M. (words per minute), and in five level Baudot code!?. There are some stations running faster speeds, but 60 W.P.M. is still the most used in QSO. ASCII is not very popular for QSO communications, since 110 baud is around 100 W.P.M.. Not too many can type this fast, but use ASCII to transfer information back and forth between computers mostly. The WIAW RTTY bulletin runs both Baudot and ASCII. You can use up to 300 baud ASCII on such bands as 15, 20, 40 and 80 meters. You can run faster speeds on 10 meters, VHF and UHF. But, when running faster speeds, someone tuning by with a carrier can sure wipe out a lot of print. On VHF and UHF, this is not a problem. There are nuts on every mode, RTTY is not an exception. There is very little intentional QRM'ing, but occasionally, there will be someone doing his fun thing to those trying to have a good time.

RTTY is the fastest growing mode today, you can tell by the increase in equipment available. There are so many things to choose from and if not careful, you can get something that will not do all you expected. In future articles, we will be covering MACHINES, VIDEO, TERMINAL UNITS and COMPUTERS. This is normally the most exciting mode that you will encounter and we will try to help you decide on the best equipment for the money. There is so much activity on RTTY, you hardly need to call CQ. I have collected a whole wall full of DX QSL cards, most of which was calling me. English is almost universal for all DX, and if this is your bag, you have a lot of typing ahead. Oh, by the way, if you are worried about your typing speed, ---- don't be! There are a lot of fellas on RTTY today that have never typed before they got on this mode. Your speed will increase as you go, as with everything, it takes practice.

Perhaps you are getting the least bit curious in this mode? Maybe you are going to, or already have, dragged out that manual on the rig? Well, just remember, when you get to going on RTTY, it has then **GOTCHA!!** Until next time, you take care and most of all, BE GOOD!!!! 73'S DE K0WVN--JOE--CUL

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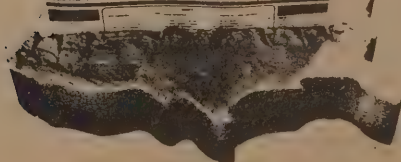
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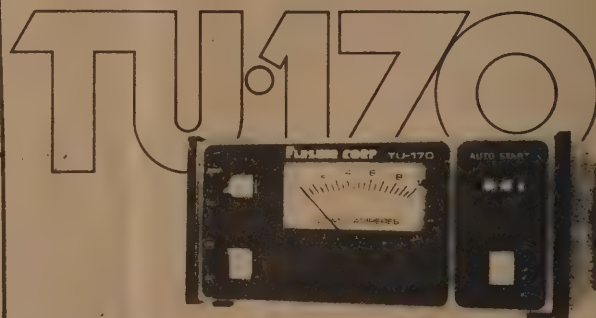
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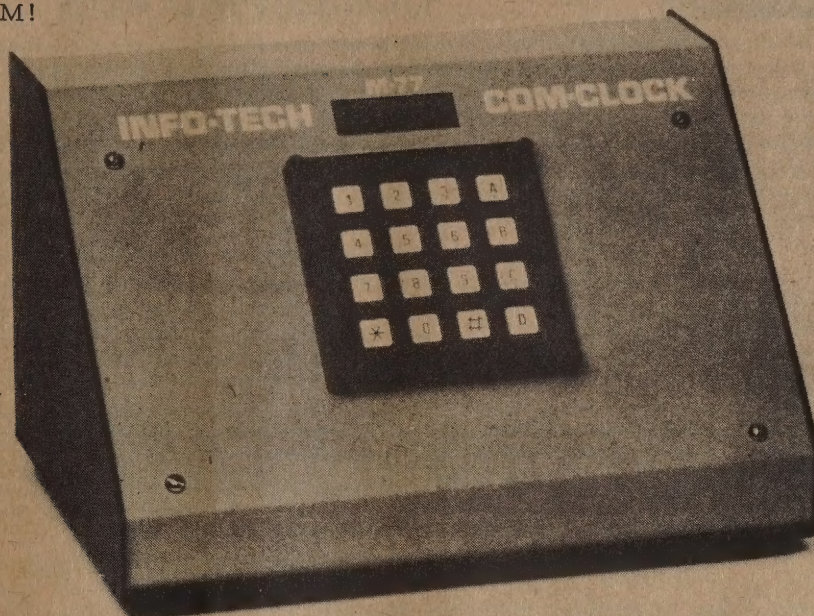
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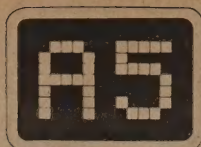
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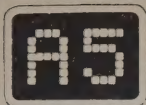
I've got Apron ATV gear, 50 watt linear, J-Beam, preamps but no pictures on 439.25 Mhz? Where are you guys on FSTV near the Flint area? Come-on Michigan! KB8NR, Floyd Hollenbeck, 1655 Dakota Avenue, Flint, Michigan 48506 (How about some 2-meter SSTV? I am ready and eager to go!)-Floyd

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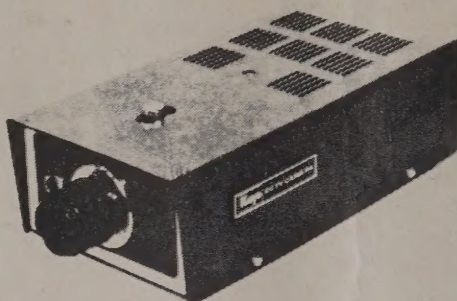
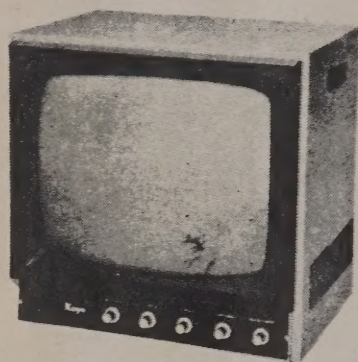
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